

MACWEEK

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In Reviews



Active-color 180c, low-cost 145B join PowerBook series

By Raines Cohen and Kirsten L. Parkinson

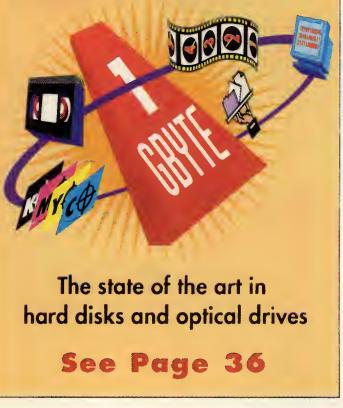
Cupertino, Calif. — Apple this week will expand its PowerBook line in two directions, adding its most affordable model and a new high-end model with crisp color.

The PowerBook 180c is functionally identical to the PowerBook 165c but features an active-matrix color screen; the PowerBook 145B is a less expensive version of the 145 that lacks a few extras found in that machine. Apple will also introduce PowerBook File Assistant, a utility software package that includes battery-management, file-synchronization and other features (see story, Page 4).

► The 180c is priced at \$4,159. See PowerBooks, Page 115

Special Report

MASS STORAGE



First-generation Newtons to deliver E-mail features

Users will be able to send objects, text

By Robert Hess

Cupertino, Calif. — The Newton personal digital assistants Apple will begin shipping this summer will let users send messages around the world at the tap of a pen.

Known as Newton E-mail, the electronic-mail software is expected to be built into all versions of the new handheld device. It will work with the 2,400-bps modem attachment that will be shipped with the first Newton devices, as well as the more-advanced communications capabilities expected in later models.

To support Newton E-mail, Apple is reportedly establishing a dedicated host mail system accessible via SprintNet, a worldwide telecommunications network that provides local, toll-free access from most cities. An Internet gateway will let users communicate with virtually all other mail services.

Newton E-mail will let users trans-



Newton E-mail's Out Box dialog.

mit data objects such as memos and notes, names and addresses, calendar events, and to-do items. While viewing any of these objects, users will be able to select Mail from a menu or write, for example, "mail John Smith" on the screen. That will turn the object's contents into a message preaddressed to John Smith if that

See Newton E-mail, Page 116

Newton momentum building

By Andrew Gore

Chicago — Apple last week marked the first anniversary of Newton's debut by offering a few more details about future directions for the personal digital assistant.

The company and its partners discussed plans for Newton devices at the Consumer Electronics Show here.

► **Delivery.** Newton will ship this summer and for less than \$1,000, according to Gaston Bastiaens, vice president and general

manager of Apple's Personal Interactive Electronics (PIE) Division.

Sources said the device will have a 20-MHz ARM RISC processor; a 320-by-240-pixel, 3-by-5-inch reflective LCD screen; a half-duplex, point-to-point infrared transceiver; and an AppleTalk-enabled serial port. Powered by four AAA batteries, Newton will have one PCMCIA slot and a tiny 2,400-bps external fax modem.

► **Desktop connectivity.** Apple has said it will offer software that lets Newton download data to a Mac or Windows-based computer. Sources said the software, code-named Dock-er, will come in two flavors: a simple backup program, and a more sophisticated product that emulates Newton's planner and Rolodex functions and is AppleScript-savvy.

See CES, Page 114

Apple soliciting users to test pen-based PBs

By Andrew Gore

Cupertino, Calif. — Apple is inviting all comers to apply to be field testers of its first pen-based and wireless PowerBooks.

Under a new program called Emerging Markets and Technologies, Apple is seeking "customers with specific business needs that have defied traditional mobile-computing technology," said Mark Orr, the program's product-line manager.

Orr said Emerging Markets and Technologies needs testers in two areas:

► **Pen-based Macs.** Apple first publicly discussed its pen-based PowerBook Duo prototype last

month at the Apple Worldwide Developers Conference in San Jose, Calif. Code-named Hancock, the unit is already being tested in the field. Orr said Apple wants to expand the number of test sites significantly this summer.

Apple's pen technology currently works with unmodified System 7.1. An extension lets users control the Finder and enter menu commands with pen gestures. For example, a "flick-up" gesture — a single upward pen stroke — entered over a window in the Finder could be used to make the window scroll up.

Orr said Apple hasn't yet
See Testing, Page 114

Real Soon

Adobe returns to drawing board for sweeping Illustrator upgrade

By Bruce Fraser

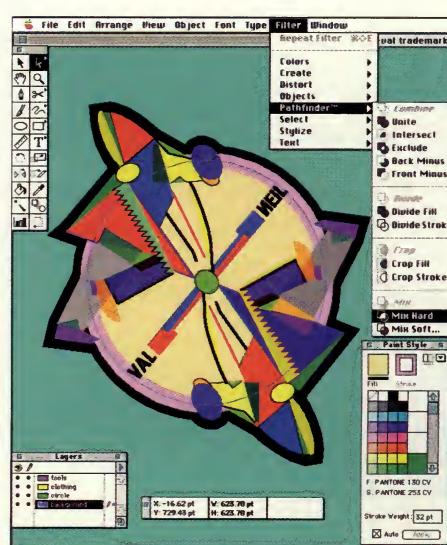
The long-awaited Adobe Illustrator 5.0, currently in beta testing, is the most sweeping revision so far of Adobe Systems Inc.'s popular PostScript illustration program. Version 5.0 leapfrogs the Windows-based

Version 4.0 with new tools, new plug-in filters and major revisions to the user interface.

Many of the new features seem designed to attain parity with Illustrator's main competitor, Aldus FreeHand. For example, Version 5.0 adds layers, a pressure-sensitive calligraphic Pen tool and the capability to edit artwork in Preview mode.

Illustrator 5.0 makes extensive use of floating palettes. The Layers palette, which resembles the Channels palette in Adobe Photoshop, allows you to create, delete and manipulate layers. You can temporarily make layers nonprintable and switch between Artwork and Preview modes independently for each layer.

When working in Preview mode, you can select filled objects by clicking anywhere inside them, See Illustrator, Page 116



Adobe Illustrator 5.0 features several new tools and a plug-in feature similar to the one found in Photoshop.

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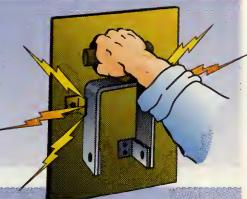
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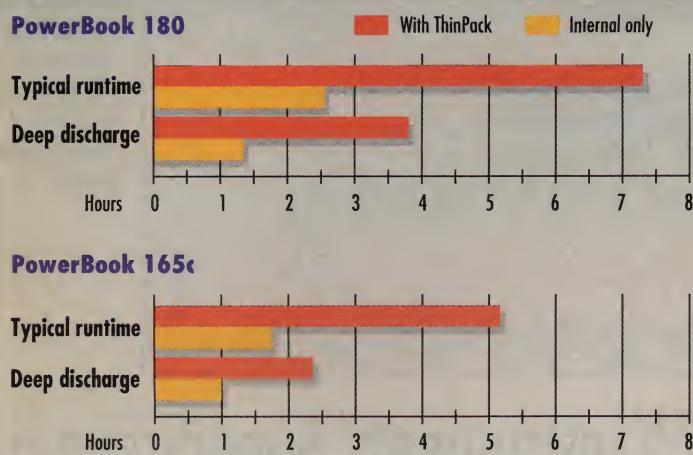
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VST ThinPack extends PowerBook runtime



Source: VST Power Systems Inc.

Thin external power pack runs PBs for 5 to 9 hours

By Raines Cohen

Concord, Mass. — VST Power Systems Inc. last week announced VST ThinPack, an external, high-density power pack it said will more than double the time PowerBook users can work without a recharge.

The 1.5-pound battery, which works with PowerBook models 100 through 180c, is only one-quarter-inch thick—small enough to slip into the side pocket of a notebook carrying case. The company said the battery, which is designed to be used concurrently with the notebook's standard internal battery, will run a PowerBook 165c for more than five hours, a 180 for more than seven hours

and a 100 for more than nine hours.

To charge a fully discharged ThinPack takes from three to five hours. No separate charger is required; users can plug the PowerBook's standard AC adapter directly into the battery.

The \$179.95 battery, due next month, contains more power cells per cubic inch than traditional nickel-cadmium batteries, which waste space by using cylindrical cells in a rectangular enclosure. The company said a ThinPack will last three to five years, or 1,000 to 1,600 cycles.

VST Power Systems Inc. is at 1620 Sudbury Road Suite 3, Concord, Mass. 01742. Phone (508) 287-4600; fax (508) 287-4068. □

White House opens up to electronic mail as Clinton, Gore get Internet addresses

By Henry Norr

Washington — Computer users can now send their opinions and advice to President Clinton, Vice President Al Gore and a handful of congressmen via electronic mail.

The White House announced last week that for the first time in history it is directly connected to the Internet.

Clinton's new Internet address is president@whitehouse.gov, while Gore can be reached at vice-president@whitehouse.gov.

In a statement the White House posted on-line last week, all E-mail messages will be read and automatically acknowledged, but the system is not yet capable of sending "a tailored response" to individual messages.

"We're working as fast as we can" to improve the system's analysis and reporting capabilities.

Most commercial on-line services offer gateways to the Internet. But Gill said the White House will continue to maintain accounts on a number of services. On CompuServe, the White House address is 75300,3115; on America Online, it is Clinton PZ.

Gill declined to say whether the White House E-mail facilities include any Macs. "We have to be nondenominational," he said. "We're all the people's president, not just one brand."

Separately, the House of Representatives' Committee on House Administration announced a pilot program called the Constituent Electronic Mail System.

So far, however, only seven congressmen have signed up for the mailboxes. Information is available at congress@HR.house.gov. □

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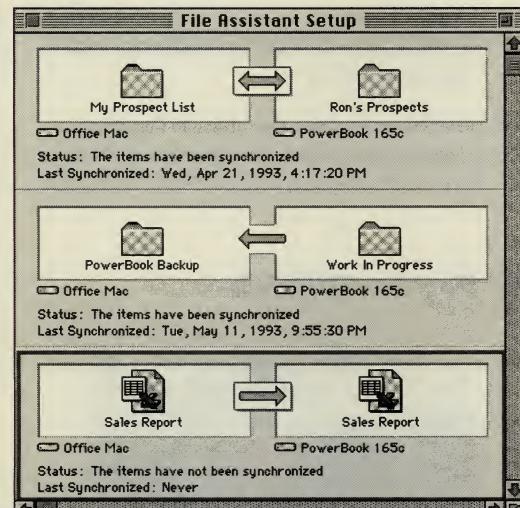
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Apple to enter PB utility arena

By Raines Cohen

Cupertino, Calif. — Along with its two new notebooks, Apple this week is scheduled to announce a \$79 package of utilities that can help PowerBook owners move among multiple environments, print while on the road and work longer between charges.

PowerBook File Assistant helps users synchronize the contents of folders on different disks. While the control panel will run on any System 7-equipped Macintosh, it is designed for users who frequently go back and forth between a PowerBook and a desktop Macintosh or network.



With Apple's new PowerBook File Assistant, users can link two folders or files by dragging them into the program's Synchronizer window. Links can be one-way or bidirectional.

Object-oriented database gets update

By Robert Hess

Pittsburgh — Developers can use a broader range of environments to build object-oriented databases with Persistent Data Systems Inc.'s IDB Object Database Version 2.0.

IDB, which costs \$995 for a sin-

gle developer license, is a development database engine that gives application developers access to object-oriented database technology. In addition to the development tool kit, a display manager assists in interface design, while a browser lets developers incorporate data-examination tools.

Version 2.0 adds support for Apple's Macintosh Programmer's Workshop, Borland International Inc.'s C for Windows, Microsoft Corp.'s Windows NT and NeXT Computer Inc.'s NeXTstep. It previously worked with Symantec Corp.'s Think C, Microsoft's C for Windows, Hewlett-Packard Co.'s Domain/OS, as well as Unix systems from Sun Microsystems Inc. and HP.

IDB will run as a stand-alone application or may be used to share data across networks running the supported platforms.

Persistent Data Systems Inc. is at 75 W. Chapel Ridge Road, Pittsburgh, Pa. 15238. Phone (412) 963-1843; fax (412) 963-1846. □

the cursor. On the PowerBooks' liquid-crystal displays, especially the passive-matrix versions, it is often difficult to find the cursor because the screen is slow to respond.

► **Deferred printing.** Like Palomar Software Inc.'s On The Road utility, the package includes software that lets users away from the office spool print files to disk for later printing.

► **Automatic network volume mounting.** A control panel similar to AutoReMounter, which is included with recent PowerBooks, automatically reconnects to previously mounted network volumes when a PowerBook wakes up or is restarted.

► **Sleep Key.** Users can switch a PowerBook into sleep mode by pressing a single user-defined key.

PowerBook File Assistant marks the launch of a new software line for Apple. The PowerBook Assistant line will include the PowerBook/DOS Companion bundle released last fall, as well as future products.

The package will be offered through retail channels. Although Apple said it is aimed at novice users unaware of third-party alternatives, some PowerBook utility vendors are concerned about Apple stealing their market share.

"Apple in the software business is strictly in the cream-skimming business," said a senior executive at a PowerBook utility vendor.

But the software maker said he is resigned to a changing market in which Apple competes with its developers.

Third-party developers "have to offer more complete solutions," he said. "The best [software makers] can hope for is that Apple licenses your stuff." □

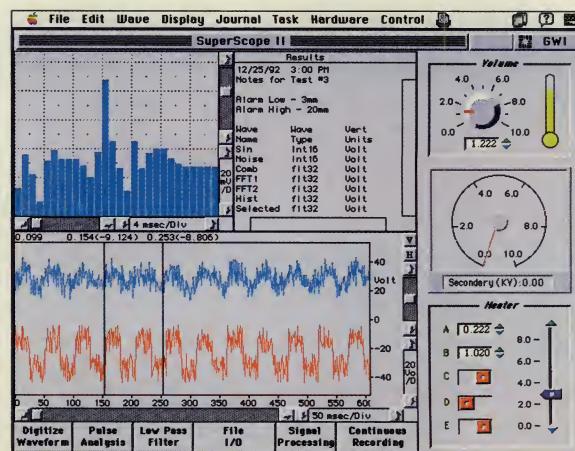
Aldus to pump up Persuasion with new dimensions

By Neil McManus

Seattle — Aldus Corp. is reportedly preparing a new version of Persuasion that will add 3-D charting, animation and hyperlinks to the presentation program.

The upgrade to the \$495 program, due later this year, will reportedly include enhancements such as:

► **Improved charting.** Persuasion will have a number of new chart types, including true 3-D charts. Users will be able to rotate and skew charts as well as change the charts' perspectives. Users will also be able to link charts, text and graphics to programs such as Microsoft Excel through Microsoft's OLE (Object Linking and Embedding) standard.



SuperScope II makes it easy for users to create instrumentation panels such as this by dragging and connecting components.

GW Instruments' SuperScope II speeds data analysis, presentation

By Raines Cohen

Somerville, Mass. — GW Instruments last week shipped a major upgrade to its SuperScope data acquisition, analysis and presentation application.

SuperScope II, a complete rewrite of the 4-year-old original, lets users create virtual instruments and digitize, analyze, plot and store to disk continuous streams or discrete blocks of waveform data.

No programming is required for many analyses; users can simply drag a wave object, for example, into a graph icon to display it. Users can also set up an on-screen journal where data is recorded and draw connections between components to link them.

The program works with the company's MacAdios I/O cards as well as with National Instruments Corp.'s cards, serial devices and IEEE-4888 instruments.

GW Instruments said a SuperScope II user can create an oscilloscope with 11 mouse clicks, a spectrum analyzer with 17 or a strip-chart recorder with 16. Users can edit the menu bar and other

interface elements to create custom applications built on SuperScope II.

Users can also go beyond the 80 built-in waveform functions either by defining their own objects and routines or by using HyperCard externals. Think C source code for the program's application programming interface is also included.

An entry-level version of SuperScope II sells for \$750 but does not allow programming of pulse analysis, filter and advanced-waveform functions. A more complete package is \$1,490, an open version that includes object code costs \$2,990, and a five-Mac site license is \$2,500. SuperScope users can upgrade to Version II for \$500.

"We used [SuperScope II] for thermocouple measurements," said beta-tester Keng Leong, an engineer at Argonne National Labs of Argonne, Ill. "We also use [National Instrument's] LabVIEW, but it was too slow and we don't need all the fancy graphics."

GW Instruments is at 35 Medford St., Somerville, Mass. 02143. Phone (617) 625-4096; fax (617) 625-1322. □

For the record

The May 24 issue misidentified the vendor of a new 21-inch color monitor. The ViewSonic 21 is offered by ViewSonic, 20480 Business Parkway, Walnut, Calif. 91789. Phone (909) 869-7976 or (800) 888-8583; fax (909) 869-7958.

Open Sesame! from Charles River Analytics Inc. will use an average of 450 to 500 Kbytes of memory, not Mbytes as stated in a May 24 article.

Mark Minshull's name was misspelled in a May 24 article on AppleScript.

► **Multimedia features.** Text and objects will be able to move along a predefined path for simple animations. Users will be able to create hot spots that let them jump to other slides, presentations and programs. The upgrade will also offer automatic highlighted builds for on-screen presentations.

► **Interface improvements.** The upgrade will have floating palettes. Users will be able to create presentations in slide view in a manner similar to that used in Microsoft PowerPoint. Persuasion will prompt users to enter titles, subtitles and text as they create new slides. Users will be able to transfer masters between the Mac and Windows versions of the program.

► **Color-palette improvements.** The palette will be optimized for eight-bit-color displays to improve the look of Photo CD and scanned images and QuickTime movies.

Bill Higgs, vice president of software research at InfoCorp of Santa Clara, Calif., said many of Persuasion's reported new features seem to be aimed at users preparing interactive on-screen presentations. "Multimedia features are the sexy stuff that sells programs, but about 70 percent of all presentations are still made with transparencies and overhead projectors," Higgs said.

Aldus Corp. is at 411 First Ave. S., Seattle, Wash. 98104-2871. Phone (206) 622-5500; fax (206) 343-4240. □

Looks like Mac users just got their very own HP LaserJet.



The new generation HP LaserJet 4M printer.

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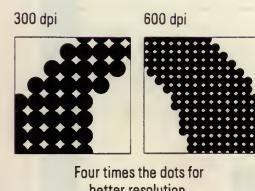
Greater flexibility. The HP LaserJet 4M printer also sets new standards in versatility, with a wide range of typefaces and two integrated paper trays.

As well as the options of a 500-sheet tray and power envelope feeder.

And it's designed to be shared simultaneously by PCs and Macs. Automatic language switching between PCL 5 and PostScript,

and 3 hot I/Os give mixed environments greater flexibility. Without compromise to either.

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If the stories you've heard about Thunder/24™ led you to believe it's the fastest color graphics card, the results of a new, independent lab test will leave you thunderstruck.

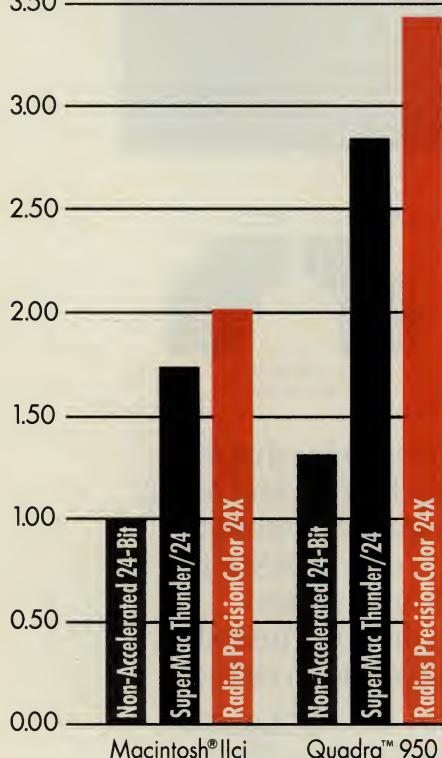
In a Hydra QuickDraw™ performance test, Ingram Laboratories found PrecisionColor 24X™ was up to 19% faster.

That's surprising, especially since the makers of Thunder/24 want you to pay \$850 more for their card.

PrecisionColor 24X isn't just faster and less expensive. It's also available in 7" and 9" versions. So it will fit in all of Apple's newly-announced systems, as well as current models.

No wonder MacUser rated PrecisionColor 24X "Best Price/Performance." And both MacWorld and Byte named it their "Readers' Choice."

Hydra QuickDraw Performance Test
Overall Performance

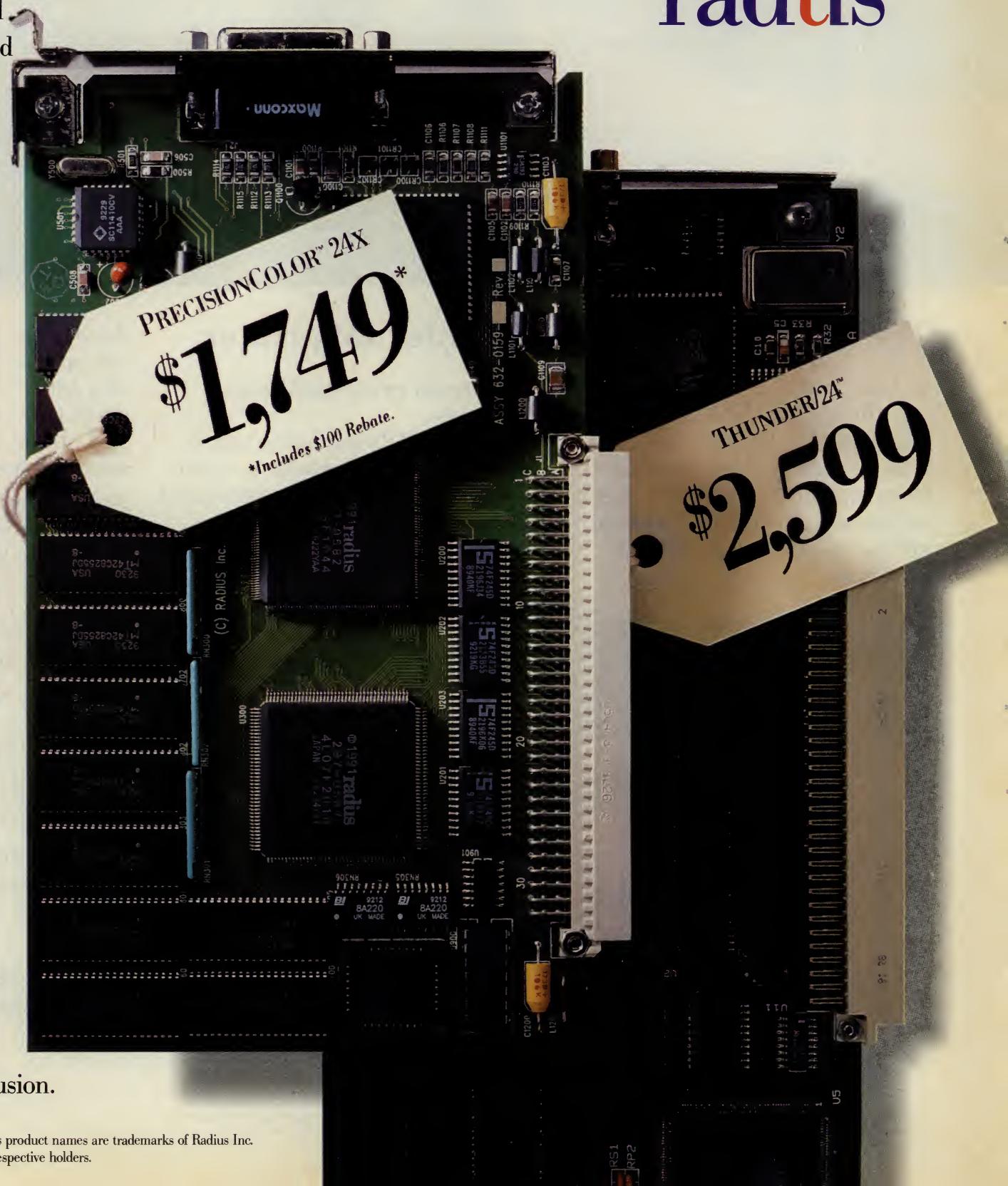


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Kodak ships print-server software

By Matthew Rothenberg

Rochester, N.Y. — Eastman Kodak Co. last week shipped a new multinet, multiplatform version of the print-server software for its Lionheart 1392 Printing System.

Lionheart Print Server Software 3.0, available as a \$2,000 upgrade, adds automatic management of print queues, resources and printer configurations, and it supports multiple networks and platforms simultaneously. Version 3.0 includes a driver for Macs as well as Windows 3.1, Kodak said. It supports Kodak's Lionheart Info Merge, File Merge, Image Merge and Image Library Management software.

The Kodak 1392 Printer, which starts at \$135,000, is based on a proprietary electro-photographic engine that uses an LED array to output as many as 92 letter- or legal-size

Dictionary for 5 languages

Pittsford, N.Y. — Microlytics Inc. has released a dictionary that simultaneously looks up words in five languages.

The \$49.95 Berlitz Interpreter stores 12,000 words in French, Italian, German, Spanish and English.

The program, which can be installed as either a desk accessory or an application, allows users to cut and paste words from the dictionary into other applications.

A flash-card feature helps users test their vocabulary in each of the languages. Users click on the icon of the language they want to use as their source. The program then displays a word in the chosen language; users attempt to supply the corresponding word in any or all of the remaining languages before the Interpreter displays the correct translations.

The European version of the program contains help documentation in each of the five languages.

An update scheduled for the end of the year will add new business words to the dictionary.

Microlytics Inc. is at 2 Tobey Village Office Park, Pittsford, N.Y. 14949. Phone (716) 248-9150 or (800) 828-6293; fax (716) 248-3868. □

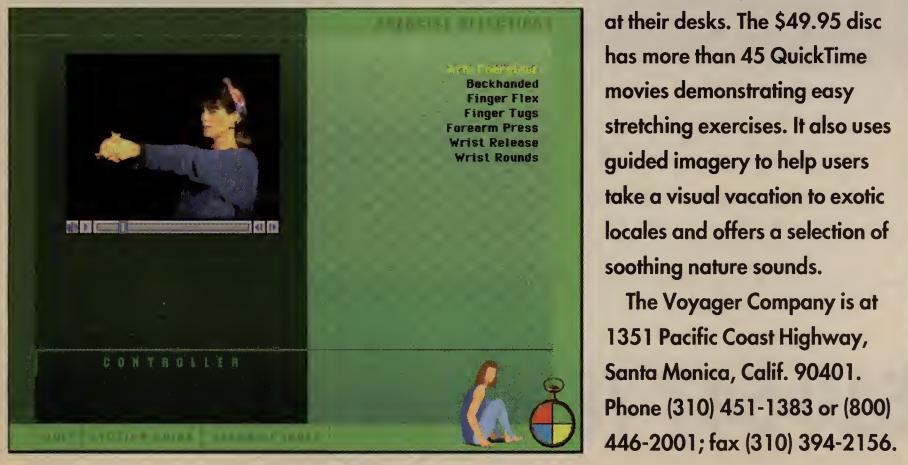
VOYAGER CD-ROM HELPS MAC USERS TAKE FIVE

If your shoulders ache from hunching over your keyboard and your stomach is churning from too much stress, you need to take a break, ergonomic experts say.

Take Five, a new CD-ROM due this month from The Voyager Company, offers a wide range of

activities to help users unwind at their desks. The \$49.95 disc has more than 45 QuickTime movies demonstrating easy stretching exercises. It also uses guided imagery to help users take a visual vacation to exotic locales and offers a selection of soothing nature sounds.

The Voyager Company is at 1351 Pacific Coast Highway, Santa Monica, Calif. 90401. Phone (310) 451-1383 or (800) 446-2001; fax (310) 394-2156.



pages per minute at a maximum resolution of 300 by 300 dpi. It supports PostScript Level 2, PCL 5 and HP-GL languages, and it includes Ethernet, TCP/IP, LocalTalk and parallel interfaces.

Eastman Kodak Co. is at 343 State St., Rochester, N.Y. 14650. Phone (800) 344-0006. □

Impact series boosts LCs to Quadra graphics level

By Neil McManus

Tukwila, Wash. — A new series of 24-bit display/accelerator cards from Extreme Systems Inc. promises Mac LC and LC II users the display capabilities of a Quadra, as well as a boost in processing performance.

The Impact RGB series, introduced this month, incorporates a 32-MHz 68030. According to Extreme, the cards make the older LC models run 25 percent to 33 percent faster than the LC III.

► **The Impact RGB/16**, shipping this month for \$699, offers 24-bit color on monitors up to 14 inches and eight-bit color on 16-inch displays.

► **The Impact RGB/19**, expected in July for \$869, provides 24-bit color to displays up to 16 inches and eight-bit graphics to 19-inch monitors.

► **The Impact RGB/21**, expected later this summer for \$929, offers 24-bit color graphics on monitors up to 16 inches, 16-bit color on 19-inch displays and eight-bit color on 21-inch monitors.

Extreme's new Impact boards come with software that lets the older LCs take control of the enhanced SANE (Standard Apple Numeric Environment) routines to accelerate math functions. An FPU (floating-point unit), which further accelerates math functions, is available as a \$70 option.

Extreme Systems Inc. is at 1050 Industry Drive, Tukwila, Wash. 98188. Phone (206) 575-2334; fax (206) 575-3928. □

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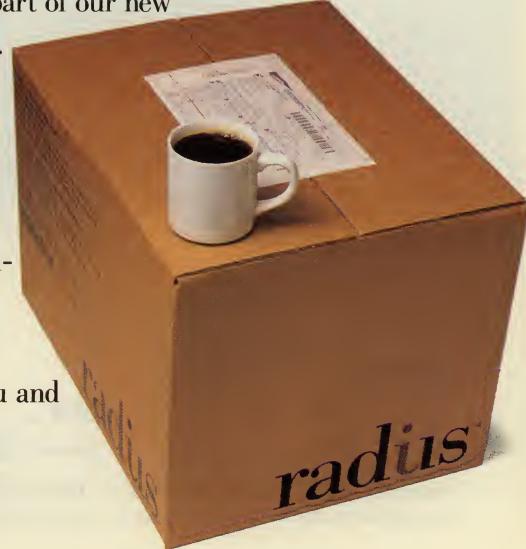
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Mutoh enters tablet market with new digitizer series

Serial-port XL line ranges up to 42" x 60"

By Nathalie Welch

Mount Prospect, Ill. — Mutoh America Inc. last month expanded from its offerings of plotter devices with a new line of digitizer tablets that it described as "aggressively priced."

Two of the three new models are Mac-compatible.

► **Mutoh IS/ONE.** This tablet offers 0.025-inch accuracy and is available in two sizes: 12 by 12 inches for \$645, and 12 by 17 inches for \$995.

The tablet plugs into the Apple Desktop Bus and supports a variety of input devices, including two- and three-switch pens and four- and 12-button cursors. It offers five predefined emulation keys and as many as 23 programmable function keys.

► **Mutoh XL.** Geared toward larger-format input, such as mapping, this tablet is available with accuracy

of either 0.010 mm or 0.005 mm.

The model with 0.010-mm accuracy comes in four versions, ranging from 18 by 24 inches for \$1,550 to 42 by 60 inches for \$2,550; the model with 0.005-mm accuracy also comes in four versions, ranging from \$3,050 for an 18-by-24-inch tablet to \$5,050 for a 42-by-60-inch tablet.

Mutoh XL requires a Mac serial interface available from Mutoh for \$50. It can be used with a three-switch pen or four- or 16-button cursors.

Both the Mutoh IS/ONE and the Mutoh XL ship with the Pensmith Driver, software developed by Kurta Corp. that lets users exchange running mouse programs with digitizer programs without having to reconfigure the tablet's software. The tablets support a variety of Mac graphics programs.

Pointing devices are priced separately.

Mutoh America Inc. is at 500 W. Algonquin Road, Mount Prospect, Ill. 60056. Phone (708) 952-8880; fax (708) 952-8808. □

RasterOps ships display board, 20-inch monitor

PaintBoard promises QuickDraw boost

By Connie Guglielmo

Santa Clara, Calif. — Once again putting its color-handling expertise to the test, RasterOps Corp. last week began shipping a new 24-bit display board and 20-inch color monitor for the Macintosh.

► **PaintBoard Turbo** is a \$1,499 board that promises to accelerate QuickDraw as much as 50 times faster than standard unaccelerated QuickDraw, according to the company.

Other features include nine-bit DAC (digital-to-analog converter), compared with the eight-bit DAC standard supported by most other display boards. RasterOps claims the nine-bit DAC significantly improves the display of highlights, shadows, textures and patterns in 24-bit-color images.

The PaintBoard Turbo works with color monitors as large as 20 inches from RasterOps, Apple and most third-party vendors. It gives

users access to a virtual work space as much as four times the monitor size, up to a maximum size of 4,096 by 1,024 pixels, which users can maneuver around using the board's hardware pan and zoom.

► **The 20/20 Multimode Color Display** is a 20-inch, two-page color display with a list price of \$1,799. The display offers resolutions from 640 by 480 pixels to 1,152 by 870 pixels and a refresh rate of 75 Hz.

The monitor requires a graphics

display board and is compatible with boards from RasterOps, Apple and other third-party vendors.

In addition, it works with RasterOps' Paint PC 24-bit display board and products from Truevision Inc. to run on IBM PC- and compatible-based systems.

The 20/20 offers digital controls and a tilt-and-swivel stand.

RasterOps Corp. is at 2500 Walsh Ave., Santa Clara, Calif. Phone (408) 562-4200 or (800) 729-2656; fax (408) 562-4066. □

AMUG offers faster Quadra 950 speed

Phoenix — The Arizona Macintosh Users Group is offering a Quadra 950 upgrade that boosts the machine's processor speed to 42 MHz.

A standard Quadra 950 is rated at 33 MHz. AMUG offers a conversion whereby it swaps a user's Quadra logic board for one with several replaced components and a new fan. The result is an increase in performance of about a 20 percent to 30 percent, according to the user group.

AMUG can perform the conver-

sion at its facility or at a user's site for the additional cost of air fare and accommodations. Normally \$499, the Quadra 950 upgrade costs \$299 until mid-September. Users pay shipping to and from AMUG.

AMUG also offers a \$499 conversion for the Quadra 700, boosting its speed from 25 to 33 MHz.

The Arizona Macintosh Users Group is at 4131 N. 24th St., No. A-120, Phoenix, Ariz. 85016. Phone (602) 553-8966; fax (602) 553-8771. □

Ethernet Speeds—LocalTalk Prices

Why is everyone talking about Ethernet? Speed.

Why does everyone still use LocalTalk? Price & ease of use.

So, we challenged ourselves, "Is there a way to get Ethernet performance at a LocalTalk price?"



Performance

Ethernet 12 sec.
TribeStar 22 sec.
LocalTalk 80 sec.

Time to complete 8 simultaneous downloads of a 200KB file from a Mac 11 running AppleShare.

Price

TribeStar	\$1795
Ethernet	\$8800

Approximate cost for a 25 node network, excluding wiring. All prices are list.

TribeStar delivers more than 80% of the speed increase you would get from a complete Ethernet upgrade. ★ At \$1795, TribeStar's price is truly "LocalTalk." ★ When you add up *all* the costs of Ethernet, including wiring and hubs, TribeStar is "very cost-effective," as MacUser put it.* ★ Over time, you may want to connect more of your users directly to Ethernet. TribeStar offers the perfect path. When users require increased speed, simply switch them to the Ethernet side. ★ So get TribeStar, the performance you need at the price you want. ★ Call today for more information and a free demo disk.

* MacUser, June 1993, pg. 140

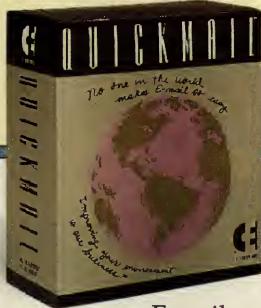
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Free QuickMail LAN Pak. Instead of taking our word for it, see for yourself how easy QuickMail 2.6 is to use and administer. Just head to your nearest dealer and arrange installation of your free QuickMail 5 User LAN Pak. For the dealer nearest you, call us toll-free at 1-800-523-7638 Dept. CE 311. *Improving your environment is our business.™*



Helst adds multimeeting support to REG+

Meeting participants now easily categorized

By Kirsten L. Parkinson

Scotia, N.Y. — Helst Systems last month unveiled REG+ 2.0, an upgrade that enables the meeting-registration program to support multiple meetings.

Written in ACI US Inc.'s 4th Dimension, REG+ lets users store data about people registering for

conferences and workshops, then automatically print badges, tickets and receipts for each participant on a single perforated sheet of paper.

Enhancements in Version 2.0, which is available now, include:

► **Multiple-meeting support.** REG+ stores registration information about multiple meetings in a single database, allowing users to enter data once for a person participating in more than one meeting.

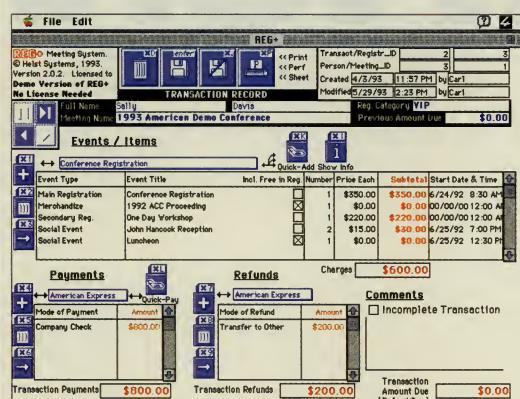
► **Unlimited participant categories.** Users can now define an unlimited number of categories for meeting participants, such as member, nonmember, student and guest, and then assign different pricing structures to each of those categories. The previous version offered only four predefined categories.

► **New reports.** Version 2.0 in-

cludes about 15 new financial-report forms.

A single-user, single-meeting version of REG+ that supports up to 300 meeting participants costs \$450. A single-user system with unlimited meetings and participants is \$1,650; the same system for four networked users is \$2,550. A year of automatic upgrades is 20 percent of the purchase price.

Helst Systems is at 26 Pinewood Drive, Scotia, N.Y. 12302. Phone (518) 384-1353. □



Version 2.0 of REG+ lets users store information about multiple meetings, conferences and workshops in one database.

Chang's TableServer ties together data from different applications

By Robert Hess

Cupertino, Calif. — Chang Labs Inc. has a solution for developers and users curious to see AppleScript put to practical use: TableServer, a program designed to let users swap numerical data between applications.

The windowless application functions as a server for columnar data. Applications that are capable

of sending Apple events may copy data from their proprietary structures into TableServer tables for transfer to other applications and tab-delimited files. For example, Chang Labs said, TableServer could manage lists of inventory items so that a scriptable invoicing system could look up item prices.

Chang Labs said TableServer supports the Required, Core and Table suites of AppleScript and can run in as little as 100 Kbytes of memory. The company plans to include TableServer with future scriptable versions of its \$495 C•A•T contact manager, as well as offer source code to developers and consultants as both a utility and learning tool.

TableServer sells for \$99 but will cost \$49 until Macworld Expo in August.

Chang Labs Inc. is at 10228 N. Stelling Road, Cupertino, Calif. 95014. Phone (408) 727-8096; fax (408) 252-3081. □

T.S. MicroTech's FanCard cools hot Macs

By Robert Hess

Torrance, Calif. — T.S. MicroTech Inc. has introduced a NuBus-based fan to increase circulation and reduce heat inside Macs. According to the company, heat buildup within a Mac can damage components, and the fans built into Macs can offer insufficient circulation.

Intended primarily for Quadra-level Macs that act as video and graphics workstations, the FanCard is a NuBus card with a single or dual

fans attached. T.S. MicroTech, which produces similar components for the IBM PC-compatible market, said the FanCard is virtually silent and requires very little voltage to operate.

A FanCard with a single fan sells for \$89.95; a dual-fan model is \$109.95.

T.S. MicroTech Inc. is at 20818 Higgins Court, Torrance, Calif. 90501. Phone (310) 787-1640; fax (310) 787-1647. □

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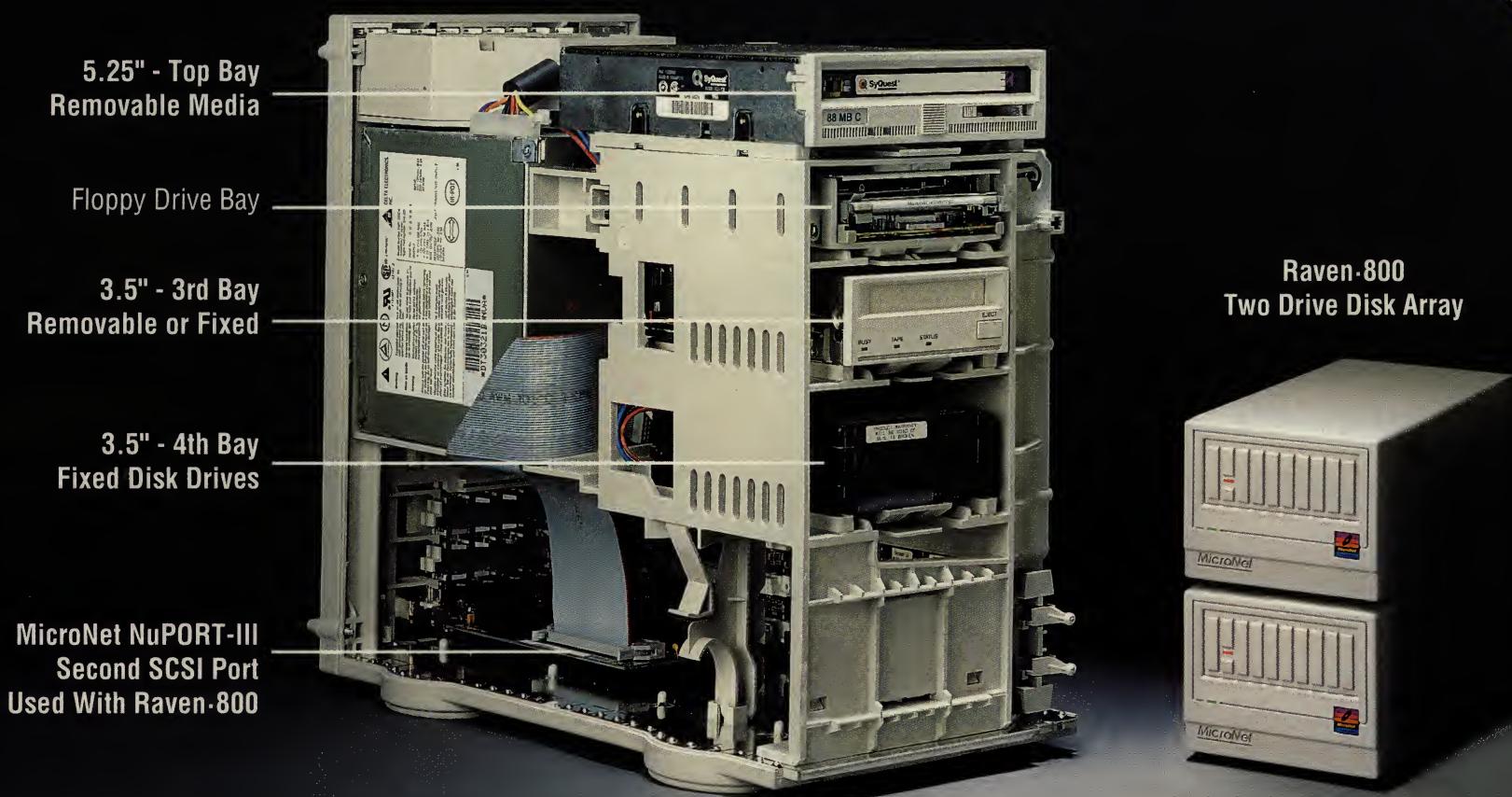
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MicroNet's Raven-800. Disk Array Power For The Quadra 800.

MicroNet is the first to bring disk array power to the Quadra 800. With a matched pair of fast spindle drives, the Raven-800 delivers up to 9.2 MB/second sustained transfers with access time as fast as 4 ms.

Disk arrays can improve performance up to 400 percent over standard drives. Combine MicroNet's Raven-800 disk array with the speed of the Quadra 800 and you have an unbeatable system for applications such as PhotoShop, fileservers, and full rate digital video and audio recording.

Cost effective two drive disk arrays are available in capacities of 1030 to 5560 MBytes and are expandable to more than 38 GBytes. MicroNet also offers single disk drive systems that can be upgraded to a Raven-800 disk array at a later date.

Built on award winning technology, the Raven-800 takes full advantage of Apple's existing hardware. One drive connects to the native SCSI port of the Quadra, and one connects to a MicroNet NuPORT-III, SCSI-2 host adapter. Together, these two drives create a fast, parallel, 16-bit data path.

MicroNet has designed a complete family of internal storage systems for the Quadra 800. Included are SyQuest removable systems, rewritable optical drives, and DAT backup systems. All are shipped complete with custom designed bezels.

To put high performance disk array power in your Quadra 800, call MicroNet's Sales Department for configuration assistance or the name of your nearest Reseller. 1-714-581-1540.

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Philmont system helps users build presentations

By Lisa Pifarre

Philmont, N.Y. — The Philmont Software Mill is shipping an upgrade to its Mac multimedia presentation software that streamlines the creation and navigation of interactive presentations.

The Philmont Symposium System 2.2 allows users to create presentations for training, electronic publishing and interactive kiosks. These presentations — called Symposiums — are designed to be viewed by only one user at a time.

FWB bases 1.3-Gbyte MO on Maxoptix mechanism

San Francisco — Storage vendor FWB Inc. this week will apparently be first out of the gate with a 1.3-Gbyte magneto-optical drive, using a new Maxoptix mechanism billed as the fastest in its category.

The hammerDisk1300FMF, slated to ship in July at \$4,999, is based on Maxoptix's T3-1300 mechanism, which provides an average seek time of less than 19 milliseconds and maximum read transfer rates of 2.2 Mbytes per second.

The 5.25-inch drive, which has 4 Mbytes of cache memory built in, will read and write 650-Mbyte cartridges, Maxoptix's proprietary 1-Gbyte cartridge format and cartridges from other 1.3-Gbyte drives. It will ship with one cartridge; pricing for additional cartridges has not been determined.

Maxoptix is one of four vendors that have announced optical mechanisms in the new 1.3-Gbyte capacity (see story, Page 37). Sony Corp. and Hewlett-Packard Co. in April unveiled their OEM drives, which will ship later this year. IBM Corp.'s 1.3-Gbyte optical drive is not available in Mac-compatible configurations.

FWB Inc. is at 2040 Polk St., Suite 215, San Francisco, Calif. 94109. Phone (415) 474-8055; fax (415) 775-2125. □

Radius cuts display prices

San Jose, Calif. — Radius Inc. last week dropped the prices of its monochrome display systems by as much as 29 percent.

The Radius Two-Page Display/21, a 21-inch system with a resolution of 1,152 by 870 has been reduced from \$1,399, to \$999. The similarly configured Two-Page Display/21E, which meets Swedish safety standards for extremely low-frequency and very low-frequency emissions, has been lowered from \$1,599, to \$1,299.

The Two-Page Display/19, a 19-inch system with a resolution of 1,152 by 870, has been cut from \$1,099, to \$799. In the 15-inch category, the Full-Page Display has been reduced from \$699, to \$549. The Radius Pivot, which can display in both portrait and landscape modes, has been lowered from \$699, to \$549. Both systems offer a resolution of 640 by 870.

The Radius systems work with the built-in video of newer Macs. Radius offers adapters for other Macs.

Radius Inc. is at 1710 Fortune Drive, San Jose, Calif. 95131. Phone (408) 434-1010; fax (408) 434-0770. □

The \$75 program is made up of two parts: Symposium Creator and Symposium Explorer.

Symposium Creator lets users generate presentations by combining existing QuickTime movies, HyperCard stacks, PICT images and text files. The new version gives Symposium designers the ability to create documents that

combine graphics and text. Symposium Creator also includes a rudimentary color drawing program for generating shapes such as squares, circles, polygons and ovals.

Symposium Explorer is the navigation engine. It allows users to search through presentations by keywords, an alphabetized

topic index or a graphical map of the presentation. Explorer Version 2.2 also sports a simplified interface for the program's navigation options.

Current owners of Philmont Symposium System Version 1.0 can upgrade for free. Runtime versions of Symposium Explorer are \$15 per user.

The Philmont Software Mill is at 14 Maple Ave., Philmont, N.Y. 12565. Phone (518) 672-4890 or (800) 527-9199; fax (212) 420-9365. □

THIS SHOULD GIVE YOU OF WHY WE CREATED AI

The image you see over there started out attached to the image you see over here. But as this document made its way down to the printer, the Macintosh it was created on recognized a small problem: 11 x 17 pages can't fit through 8 1/2 x 11 printers.

And so, out came the electronic scissors.

Now, if you're like many Macintosh users, you know all about this routine. And you know how it feels to walk into a meeting with a layout that contains hours of blood, sweat and tears, and a fat strip of tape right down the middle.

Enough said.

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COMPAQ PAGEMARQ Laser Printers. A line of

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*This service, provided by contract service providers, is specific to hardware products and may not be available in certain geographic locations. Consult the Compaq Customer Support Center for further details. ©1992 Compaq Computer Corporation. All Rights Reserved.

Logica offers PDS cards for more Macs

By Carolyn Said

Austin, Texas — Logica Research Inc. is now shipping a revamped line of its LogiCache accelerators and offering cards for additional Mac models.

The 50-MHz 68030 processor direct slot cards are \$749, or \$899 with a math copro-

cessor. Previously available only for the Mac IIx, IIcx, IIsi and SE/30, the PDS cards are now also offered for the Mac II, IIci, IIvx and IIvi; Performa 600, 400, 405 and 430; LC, LC II and LC III; and the SE, Classic and Color Classic.

Adapters, which sell for \$59 each, are

required for all CPUs except the IIci, IIvx, IIvi and Performa 600.

Logica offers 64-Kbyte cache cards for the IIsi for \$179 and the IIci for \$169. The company also has a line of FPU (floating-point unit) boards; pricing varies according to market fluctuations.

Logica said it plans to release a 25-MHz 68040 PDS accelerator this summer. That card will be priced in the \$1,200 range.

DiiMO Technologies Inc., based here, for-

merly did engineering work for Logica but is now selling its own line of accelerators under the name of DiiMOCache (see MacWEEK, May 31). DiiMO's cards are the same design as those formerly marketed and manufactured by Logica, which said it is now using a different engineering company for its cards.

Logica Research Inc. is at 8760A Research Blvd., Suite 313, Austin, Texas 78758. Phone (512) 836-2168 or (800) 880-0988; fax (512) 832-1533. □

News B R I E F S

APS to ship 105MB drive

Kansas City, Mo. — APS Technologies this month plans to ship a 3.5-inch external SyQuest drive with a capacity of 105 Mbytes per cartridge. The \$749 APS SQ 3105, which ships with one cartridge, provides an average seek time of 12 milliseconds and transfer rates of up to 1.2 Mbytes per second. Additional cartridges are \$79.

APS Technologies is at 6131 Deramus, P.O. Box 4987, Kansas City, Mo. 64120-0087. Phone (816) 483-6100 or (800) 235-2753; fax (816) 483-3077.

Hebrew CD-ROM price drops

Chicago — Davka Corp. is making it less expensive to bone up on the Bible and Talmud. Until at least July 15, the company will sell its Judaic Classics Limited Edition CD-ROM, which contains the complete Hebrew text of the Old Testament and the Babylonian Talmud, for \$49.95. The disc usually sells for \$129.

Davka Corp. is at 7074 N. Western Ave., Chicago, Ill. 60645. Phone (312) 465-4070; fax (312) 262-9298.

PaperTemplates series ships

Lyndhurst, N.J. — PaperDirect is shipping PaperTemplates, a series of software templates pre-formatted for output to the company's business forms, postcards, certificates and mailing labels.

The \$39.95 package contains 120 templates that can be opened from within Microsoft Word, Aldus PageMaker and QuarkXPress.

PaperDirect is at 205 Chubb Ave., Lyndhurst, N.J. 07071. Phone (800) 272-7377.

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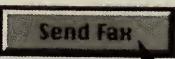
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Add an Internal FAX Modem and you can turn your Mac into a personal fax machine. One that will send and receive PostScript quality faxes in any size up to 11x17.



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Property Manager adds templates

By Kirsten L. Parkinson

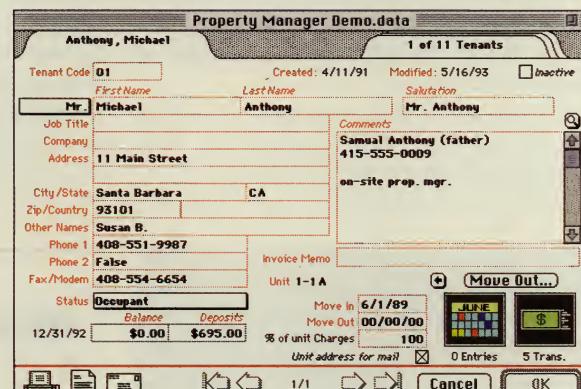
Santa Barbara, Calif. — An upgrade of Transoft Property Manager from Transoft Corp. adds a slew of new templates and multi-user support to help property owners and managers organize their information.

Like previous versions, Transoft Property Manager 2.2 combines accounting functions with an ACI US Inc. 4th Dimension database for storing information about tenants, vendors and owners. New features of Version 2.2 include:

► **Multi-user support.** The program now lets as many as 20 users access a central database simultaneously. The previous version supported only single users.

► **Accounting improvements.** New accounting features include built-in 1099 tax forms, support for aging reports, and integrated invoice and purchase-order forms. The program automatically calculates late charges and compiles reports up to 50 times faster.

► **New templates.** Transoft Property Manager 2.2 adds about 50 new document and



Property Manager 2.2 allows as many as 20 users to access information about tenants, vendors and property owners simultaneously.

report templates, including repair notices, rental-agreement forms and holiday messages.

A Basic single-user configuration of Property Manager, which handles as many as 100 housing units, costs \$495; a \$995 Pro version supports unlimited units. Basic and Pro upgrades are \$149 and \$195, respectively.

Transoft Corp. is at 31 Parker Way, Santa Barbara, Calif. 93101. Phone (805) 963-7181 or (800) 949-6463; fax (805) 963-7178. □

Madacon '93 highlights now available on CD-ROM

Cupertino, Calif. — Highlights from February's Madacon '93, the fourth annual conference for developers using object-oriented technology, are now available on CD-ROM.

MADA, previously the MacApp Developers Association, is a nonprofit organization of primarily Mac developers.

The CD-ROM contains the soundtrack from the show's keynote address, a QuickTime slide

show and audio presentation of the Bedrock development environment, slides from most of the sessions and sample source code from vendors who demonstrated technology.

The disc is available to MADA members for \$95. Membership is \$75 a year.

MADA is at 10062 Miller Ave., Suite 202-B, Cupertino, Calif. 95014. Phone (408) 253-2765; fax (408) 253-2767; AppleLink, MADA. □

TransPac releases word processing tools for Chinese, Japanese

By Lisa Picarille

San Jose, Calif. — TransPac Software Inc. last week released a trio of foreign-language word processing tools designed for Mac users who need to translate, edit and print documents containing both English text and Japanese- or Chinese-language characters.

► **Japanese Shasta 1.1** provides on-line English-to-Japanese translation for more than 100,000 words. Shasta parses English words and phrases and displays Japanese definitions. The \$195 program, which requires KanjiTalk 6.0.7 or later, can be invoked from any application and supports multiple dictionaries.

► **Japanese TurboWriter 2.2** is a word processor for creating, editing and printing documents containing Japanese and English text. The \$295 program, which requires KanjiTalk or Apple's Japanese WorldScript module, supports a variety of Japanese language features, including vertical text. It offers KanjiTalk in-line conversion using Apple's Kotoeri input method, in which users enter the phonetic spelling of a Japanese word and the program converts the word into the appropriate kanji character.

► **Traditional Chinese TurboWriter 2.0** provides functionality similar to Japanese TurboWriter. The \$395 program, which requires ChineseTalk 6.0.6 or later, offers in-line conversion using a built-in phonetic input method with an 80,000-word dictionary. It is bundled with an English-Chinese dictionary.

TransPac Software Inc. is at 4300 Stevens Creek Blvd., Suite 245, San Jose, Calif. 95129. Phone (408) 261-7550; fax (408) 984-6303. □



FROM THE Bookshelf

Running Microsoft Works 3 for the Apple Macintosh

By Charles Rubin

Through the eyes of fictional video store owner Al Chroma, this book instructs users on how to organize business records and prepare custom sales materials.

The book also details how to set up an inventory system and analyze profits using the word processing, database, spreadsheet, graphics and communications productivity tools.

\$24.95 / 400 pages / ISBN 1-55615-388-0

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Using ClarisWorks

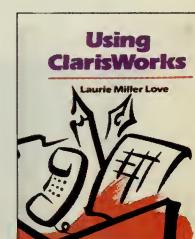
By Laurie Miller Love

This guide to the integrated package offers advice on how to create a sales report, logo and letterhead; amortize a loan; and merge database information with form letters and labels.

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The Macintosh Bible Guide to ClarisWorks

By Charles Rubin

With sections corresponding to each module of ClarisWorks, this book attempts to teach the integrated package in small chunks.

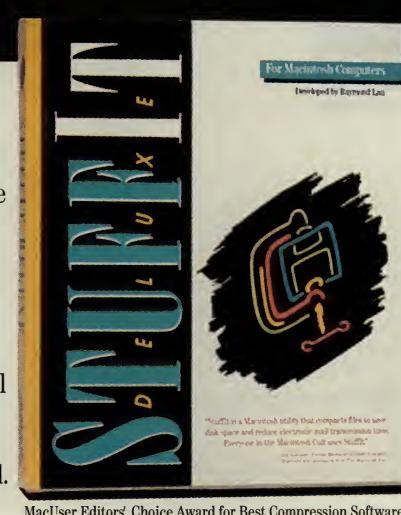
\$22 / 400 pages / 1-56609-051-2

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Management

Site licensing saves users more than just money

Large companies can reap multiple benefits from site license contracts.

By Larry Stevens

The discounts that you get from site licenses are important. But many managers say the administrative advantages are even greater than the cost-savings of discount purchasing.

Site licenses used to simply be a means of saving money through volume purchasing. Certainly the 10 percent to 25 percent discount many software companies offer their larger customers is nothing to sneeze at. But recent site-license contracts also save on administrative overhead by reducing the corporation's need to store, distribute and monitor software.

By offering applications on CD-ROM instead of in shrink-wrapped boxes and providing relatively easy ways to license individual users and distribute software, software vendors increase the value of their site licenses.

Administrative costs. "There are two costs to acquiring software: the cost of the packages themselves and the cost of administering and distributing the packages," said Michael Gravis, a management analyst at the Metropolitan Water Reclamation District of

Greater Chicago (MWRDGC). "The older site licenses helped with the first cost. Finally, we have licenses that also assist in the administrative area."

Software vendors, who have fielded complaints from corporate customers for years about the burden of administrating the flood of shrink-wrapped packages, are finally beginning to do something about the problem. Several publishers, including Claris Corp., WordPerfect Corp., Microsoft Corp. and even Apple, are offering new or improved license contracts to lighten the administrative load on information technology departments (see story, Page 18).

About his Site Management Program (SMP) from Claris, Gravis said, "It certainly gives us an upfront savings, but that's minimal." Yet he said that as a result of the contract, his company will enjoy a \$60,000 annual savings resulting from a more efficient means of distributing and monitoring software.

While MWRDGC wants its Mac and IBM PC and compatible users to try out new categories of software, it prefers that they stan-



TOM BARR/BLACK STAR

David W. Smith, vice president of information technology at PPG Industries in Pittsburgh, hopes that encouraging employees to access software from one vendor will put them in a better position to collaborate with each other.

dardize on a limited number of packages. It also has to prevent users from placing unlicensed software on their hard disks.

Gravis looked at the cost of inventory, considered the administrative burden of tracking CPU serial numbers and calculated the labor hours necessary to make periodic audits of machines. He also estimated the time and morale cost of taking administrative action against employees who violated software license agreements.

Although it may be an unusual step at most companies, Gravis said he would have had to hire someone to administer software licenses. "The

bottom line was we needed at least one full-time person. With salary and benefits, we figured \$60,000."

The Claris SMP eliminates most of the administrative costs for MWRDGC. It is server-accessible and comes as a CD-ROM instead of in shrink-wrapped boxes, saving warehouse space. MWRDGC permits and even encourages users to copy any software onto their hard drive, so piracy is not an issue. MWRDGC urges users to standardize on Claris products because they're easier to acquire than other publishers' software.

The only requirement for users
See Site licenses, Page 18

Calendar of Events

J U N E

11-12: MacFair LA '93, Los Angeles. Exposition and conference co-sponsored by Apple. Contact Los Angeles Macintosh Group at (818) 574-8047; fax (818) 574-5028.

12-16: Nexpo, New Orleans. Newspaper technical trade show. Formerly the American Newspaper Publishers Association conference. Contact Newspaper Association of America at (703) 648-1000; fax (703) 648-1333.

13-17: Electronic Messaging '93: The Decade Ahead, Atlanta. Tenth annual conference of the Electronic Mail Association. Contact the Electronic Mail Association at (703) 875-8620; fax (703) 522-0241.

14-15: The Outsourcing Conference, San Francisco. Conference exploring the opportunities, strategies and realities of outsourcing. Con-

tact Digital Consulting Inc. at (508) 470-3880; fax (508) 470-0526.

14-16: Client/Server World, Boston. Conference on technical and managerial issues of client-server applications and networks. Contact Digital Consulting Inc. at (508) 470-3880; fax (508) 470-0526.

14-17: MicroSystems Forum, San Jose, Calif. Conference, expo and seminars on emerging alternatives in key areas of microcomputer design, including wireless communications and microprocessors for personal digital assistants. Contact MicroDesign Resources at (707) 823-4004 or (800) 527-0288; fax (707) 823-0504.

14-17: Object World, San Francisco. Object-oriented programming technology conference and exhibition. Contact IDG World Expo Corp. at (508) 879-6700 or (800) 225-4698; fax (508) 872-8237.

16-18: MacHack, Ann Arbor, Mich. Technical conference for Mac developers. Contact Expotech Inc. at (313) 882-1824; fax (313) 882-6942.

16-18: Enterprise '93, Boston. Conference and exhibition on "critical business issues" facing the enterprises of the '90s. Contact IDG World Expo Corp. at (508) 879-6700 or (800) 225-4698; fax (508) 872-8237.

21-23: Mobile Computing Forum, Dallas. Conference for corporate end users, government consultants and systems integrators. Includes hands-on demonstrations of new mobile-computing and wireless-technology products. Contact Dataquest Inc. at (805) 298-3262 or (800) 457-8233; fax (805) 298-4388.

22-23: Los Angeles Lap & Palmtop '93, Anaheim, Calif. Portable computing and communications exposition and conference. Contact Laptop Expositions at (212) 682-7968; fax (212) 867-8277.

23-26: Digital World '93, Beverly Hills, Calif. Seybold conference and showcase on multimedia. Contact Seybold Seminars at (310) 457-8500 or (800) 433-5200; fax (310) 457-8599.

J U L Y

29-1: Mactivity, San Jose, Calif. Conference and exposition on Macintosh networking. Contact Winehouse Computer Co. at (408) 354-2500 or (800) 798-2928; fax (408) 354-2571.

29-1: PC Expo, New York. Contact Bruno Blenheim at (201) 346-1400 or (800) 829-3976; fax (201) 346-1602.

Please submit notices of conferences, trade shows and other Mac-related events to: Calendar, MacWEEK, 301 Howard St., 15th floor, San Francisco, Calif. 94105, or fax to (415) 243-3650. No training or educational seminars please.

Read my clips.

THE BOTTOM LINE

The HP ScanJet IIc sets a new standard for affordable color scanners. Its engine is fast and well-engineered, and HP's innovative color-callibration software makes hassle-free, "true"-color scans a reality. Prices at less than \$2,000, the HP ScanJet IIc is a best buy in its class.

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It's blazingly fast!



and black-and-white photos, the ScanJet IIp is an exceptional product. The scanner is just 16 inches long and 10 inches wide.

WINNING COMBINATION

To test the HP ScanJet IIc, we used the same set of tests we used for our most recent color-scanner lab report. The results showed HP's new scanner to be the best in its class in both hardware and software. The ScanJet impresses from the moment you open the box. Other

scanners use a removable screw that locks the scan head for shipping, but HP uses a locking lever that's built into the scanner itself. There's no screw to lose, and the lever is so easy to use that you'll find yourself locking the scan head more often, thereby increasing its life span.

Scanning speed, tracking accuracy, the scan head, and color accuracy showed the HP ScanJet IIc to be a top performer. In addition to scanning at an optical resolution of 400 dpi, the ScanJet IIc can scan at 200 dpi and 100 dpi. The ScanJet IIc also includes a built-in 100-MHz 386 processor, 16 MB of memory, and a 1.44-MB floppy disk.

TOP-NOTCH HARDWARE TEAMED WITH INNOVATIVE SOFTWARE MAKES HP'S NEW COLOR SCANNER A WINNER.



The HP ScanJet IIc uses a one-pass scanning method that makes it one of the fastest color scanners we've seen. It also provides time-saving color previews that dynamically display any changes you make to the scan, such as exposure, hue, and saturation modification.

◆ 1992 Diamond Awards

For an all-around scanner offering high-quality color and black-and-white images, true 400-dpi resolution, and good basic scanning software, HP's ScanJet IIc can't be beat.

Hewlett-Packard's ScanJet IIp sets a new standard for affordable desktop gray-scale scanners. From its striking compact design to

"We were extremely impressed..."

We'd hate to brag. So we'll let the Mac press do it for us.

Macworld awarded both the HP ScanJet IIc and IIp their *World Class Award*, and named the HP ScanJet IIc as the *Best Color Scanner* for 1992, and the HP ScanJet IIp as the *Best Black & White/Gray-Scale Scanner*. While MacWeek gave their prestigious *Diamond Award* to the HP ScanJet IIc.

Speed. Simplicity. And accuracy were all applauded. It's no wonder. HP's single-pass scanning delivers both lightning-fast speed and precise color registration. TWAIN support allows scanning without having to switch between applications. And HP AccuPage technology with 400-dpi resolution can tackle the toughest OCR challenges. What's more, capabilities this advanced have never been this affordable. List price on the HP ScanJet IIc is just

\$1,599. The HP ScanJet IIp is just \$879. And right now, the HP ScanJet IIc includes Adobe Photoshop LE.

Impressed? Don't just take our word for it, or even the Mac press's. Attend one of our scanning seminars that will be held April through September, 1993. To find out more about the HP ScanJet IIc and IIp or seminars in your area, call 1-800-SCANJET, Ext. 7364*. And judge for yourself.

HP ScanJet IIc



HP ScanJet IIp



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New licensing options

Software companies are offering new software licenses to accommodate users' changing needs.

Microsoft Select was developed "in response to changing needs of information technology organization," according to John Mutch, director of enterprise marketing for Redmond, Wash.-based Microsoft Corp. As a greater percentage

of personal computers are networked and as corporations try to control worldwide divisions, they need a more efficient way to buy software.

The first phase of the project makes it easier to acquire products. Phase 2 will provide information on CD-ROM databases about Microsoft's and other companies' products. A final phase "will bring Microsoft into a strategic relationship with its customers," according to Mutch.

WordPerfect Corp.'s Customer Advantage Program (CAP) allows corporate customers to place all their WordPerfect versions (for different platforms and different languages) on any network in the company. Each month, customers pay a fee based on their "high watermark," the maximum number of users who accessed the program simultaneously.

Even Apple reportedly has begun a pilot pro-

ject in which site licenses for System 7.1 are sold to selected customers (see MacWEEK, April 19).

Claris Corp.'s Site Management Program is several years old, but, until April, Claris considered each product separately to determine eligibility for discounts. Now Claris combines all products — both Mac and Windows versions — in its suite for determining eligibility for the service, as well as the level of volume discount. — By Larry Stevens

If you're not using MacTools, this is how your disk is being repaired.



*Plus \$6 S&H (AK, HI, PR & Canada \$12) plus state tax. MacTools is a registered trademark of Central Point Software, Inc. Other companies' products used for identification purposes only. ©1993 Central Point Software, Inc.

Other utilities try and patch your disk. We'll rebuild it.

Only MacTools® has catalog rebuild capabilities to fix

complex catalog damage, large hard drives, and

root folder problems. But don't take our word for

it. MACWORLD said "DiskFix (MacTools) repaired

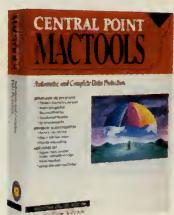
some directory damage on my hard drive that Disk Doctor

(Norton Utilities) reported it was unable to repair." There's

even a 60-day money-back guarantee. Call now for a

competitive upgrade for \$49.95* or see your near-

est dealer. And get your disk fixed once and for all.



Central Point Software, Inc.

1-800-289-9316 Ext. 3

Site licenses

From Page 16

is that they report any software they copy to a manager. Once a month, Gravis tallies the number of Claris products his users copied onto their drives and reports the number to Claris, which then bills the company.

Improved productivity and synergy.

David W. Smith, vice president of information technology at PPG Industries Inc. of Pittsburgh, said that while volume discount was an advantage, the main reason he signed up for Microsoft Select was "to improve productivity by encouraging our users to move toward more uniformity in software choices."

Smith said that in the past, "100 software acquisitions meant 100 buying decisions." Now, whenever one of PPG's 12,000 personal computer users need software, they just take it off the CD-ROM and report the action.

An added advantage is that by encouraging users to access software from one vendor, employees are in a better position to collaborate with each other.

Gravis found a similar advantage from his site-license agreement. "We can piggyback the users' natural curiosity to try out new programs. With our site-license program, we foster synergy instead of taking expensive means to prohibit it," he said.

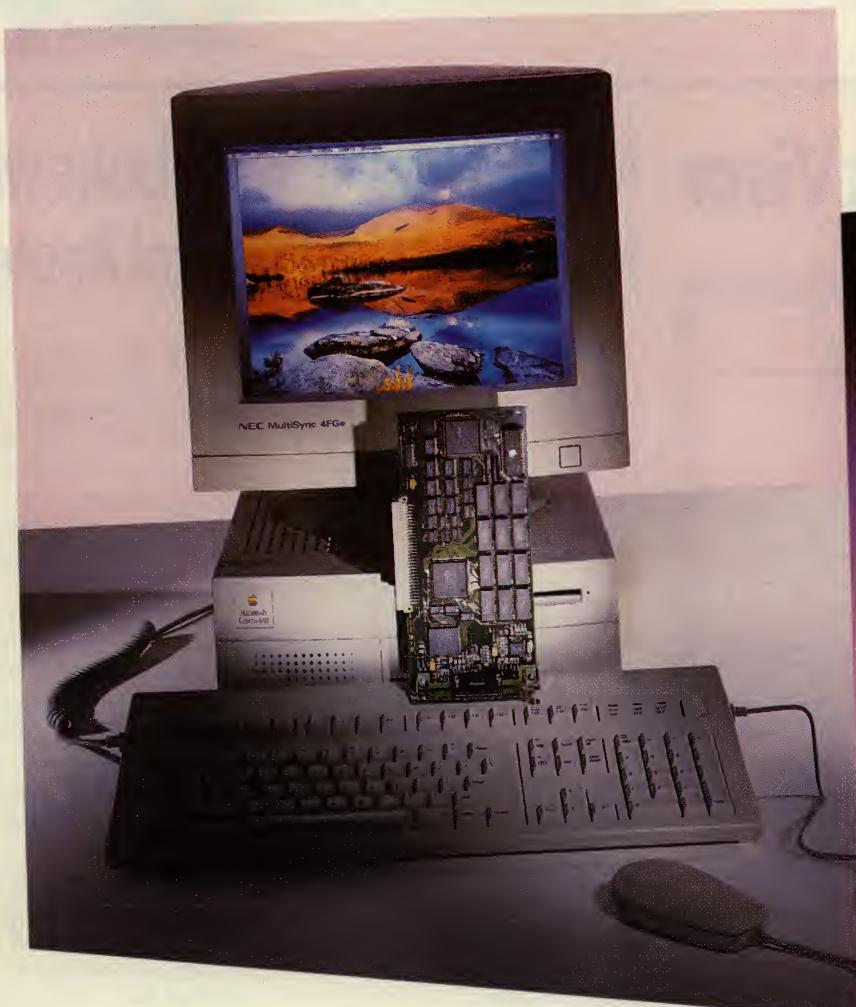
Upgrades. Most site licenses include an optional maintenance agreement that provides free, automatic upgrades.

Steve Birgfeld, manager of computing standards and support at Booz Allen & Hamilton Inc. of McLean, Va., said that the ability to upgrade at will is one of the main advantages of buying site licenses. "Our upgrade is based on our resources and the needs of our users. The site license removes the financial incentive or disincentives to upgrade."

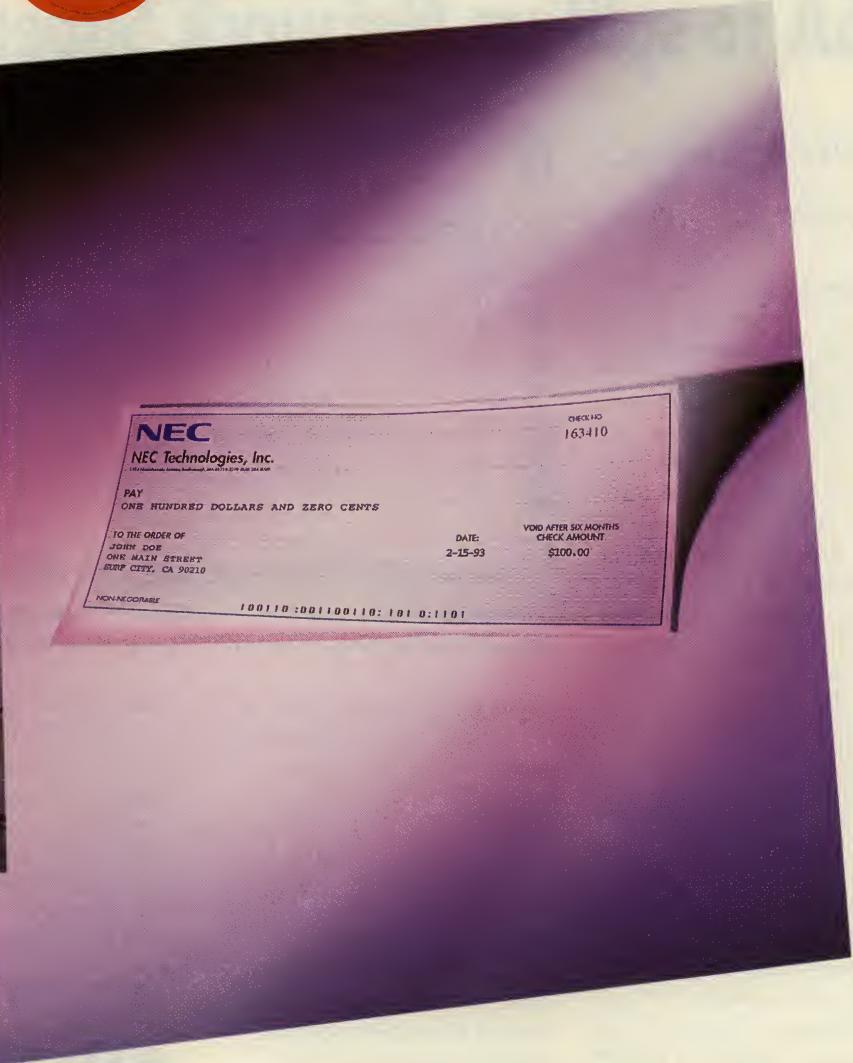
Brad Jackman, director of large-account sales at WordPerfect in Orem, Utah, pointed out that most corporations don't upgrade their entire enterprise all at once. Typically, they upgrade department by department as the training and support services become available. While a major upgrade is often administratively difficult, "a maintenance agreement eliminates one major headache — acquiring the upgrade packages," Jackman said.

Beyond discounts, site licenses that provide software on CD-ROM and allow the applications to be placed on servers are so different from older ones that merely offer discounts on 10-packs or 100-packs, vendors prefer using alternative names for the agreement. While it is easy to suspect gimmickry when hearing phrases like "product acquisition programs," there is substance to the claim that these agreements are radically changing the way software is purchased by larger customers. □

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MSA to split up Network SuperVisor

Smaller, specialized programs result

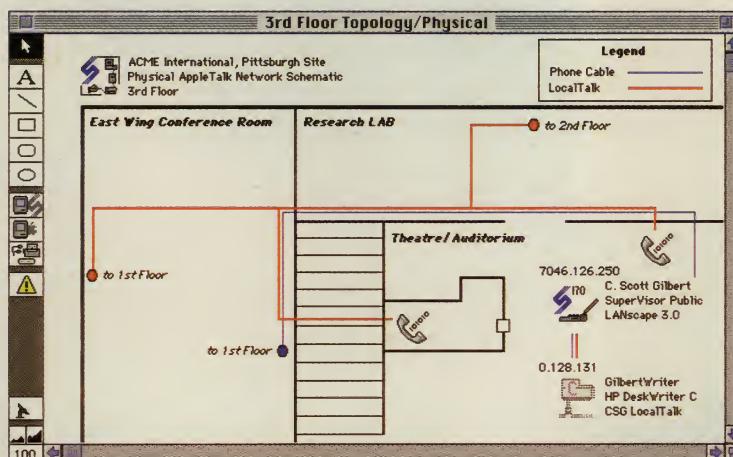
By Leonard Heymann

Pittsburgh — Shirk an all-in-one strategy, Management Science Associates Inc. is dividing up its Network SuperVisor administration program to give users the option of buying only the tools they need.

MSA this summer plans to launch a family of Network SuperVisor products from its CSG Technologies Division, beginning with the LANscape mapping program due at the end of June for \$295. In August MSA expects to unveil separate offerings that will gather an inventory of network devices and analyze those assets.

The new series of products offers users more flexibility and reduces memory requirements, the company said. The current Network SuperVisor 2.0 requires at least 3 Mbytes of RAM because it is an integrated product built on top of ACI US Inc.'s 4th Dimension database.

► **LANscape.** The first of the new products includes a network schematic application that is known as the Topology Editor in the combined package. It learns the configuration and status of client Macs via a SuperVisor Responder extension



LANscape, the first of a trio of forthcoming Network SuperVisor products, creates a network schematic that can be enhanced with drawing tools to reflect an actual floor plan.

or the Apple Responder and draws a map of the network. When devices go down, their icons turn gray and can trigger alarms.

► **LANwatch.** Formerly known as the Network Control Center, this application gathers data from the client Responders and produces reports on designated groups of Macs. Network addresses and monitors have been added to the list of features than can be scanned. Pricing has not been determined.

► **ASSETbase.** The database portion of Network SuperVisor runs faster after it was rewritten with Version 3.0 of 4th Dimension, according to MSA. Information

from LANwatch can be imported into ASSETbase, where it can be analyzed and used to create custom reports and graphs. Pricing has not been set.

Management Science Associates Inc. is at 530 William Penn Place, Suite 329, Pittsburgh, Pa. 15219. Phone (412) 471-7170; fax (412) 471-7173. □

Novell bundles WAN Links with NetWare MultiProtocol Router

By April Streeter

Provo, Utah — Novell Inc. last week rolled its multiprotocol and wide-area routing software into a single package and added source-route bridging for token-ring networks.

NetWare MultiProtocol Router Plus 2.1 now combines AppleTalk, IPX (Internetwork Packet Exchange), TCP/IP and Open Systems Interconnection routing with bridging for nonroutable protocols, such as IBM Corp.'s Systems Network Architecture.

Plus 2.1 also includes Novell's WAN Links, which allows wide-area bridging or routing via X.25 or with synchronous connections using the Point-to-Point Protocol. Plus 2.1 is available now for \$1,495. Previously, the two programs cost \$2,290 together.

WAN Links' wide-area routing software previously required a Novell NetWare server to operate.

The new version, however, may be run on any dedicated IBM PC or compatible on a NetWare network. For setting up a wide-area connection, Novell currently supports only its own \$1,195 Sync/+ adapter cards, which must be installed at both ends of the connection.

Novell said it will add the Apple Update-based Routing Protocol to the next upgrade of the multiprotocol router, which is due before the end of the year. Support for asynchronous dial-in and the AppleTalk Remote Access Protocol are also in the works, Novell officials said.

Current users who wish to add Version 2.1's bridging without adding WAN Links will pay \$299. Version 2.1 Plus upgrades are \$749.

Novell Inc. is at 122 East 1700 South, Provo, Utah 84606. Phone (801) 429-7000; fax (801) 453-1267. □

Axis puts new spin on Ethernet print servers

By April Streeter

Danvers, Mass. — Axis Communications Inc. this week is shipping a print server that lets Macintosh users on an EtherTalk network share parallel or serial printers.

The NPS 550 has one RS-232 serial and two Centronics parallel ports for connecting printers to AppleTalk, NetWare or TCP/IP-based Ethernet networks. Thin-net and 10BASE T ports also are

included in the device. It will cost \$695, which is at the high end of the price spectrum for similar products (see chart below).

Mac users can choose a spooling option when sending print jobs to an NPS 550-connected printer to achieve average throughput of 30 Kbps. According to Axis, this is more than 15 times faster than rates achieved by competing print servers with serially connected printers. In spooler mode the server does not send back its normal status messages, however.

Individual printers connected to the network via the NPS 550 may be password-protected. The print server can be administered over the network.

NPS 550 supports PostScript and Hewlett-Packard Co.'s PCL printers. It also supports SNMP (Simple Network Management Protocol). Four LEDs indicate power and print job status.

Axis Communications Inc., a subsidiary of Axis Communication AB of Lund, Sweden, is at 99 Rosewood Drive, Suite 170, Danvers, Mass. 01923. Phone (508) 777-7957; fax (508) 777-9905. □

News Analysis

In the world of X.400 messaging 1988 is still in the near future

By Nathalie Welch

Exchanging X.400 text messages is possible for most Mac users only through their LAN-based electronic-mail packages. But a newer implementation of the mail and messaging standard is bringing advanced X.400 E-mail and other new services right to the Mac desktop.

An advanced X.400 implementation would let users create E-mail containing both text and graphics, access an integrated enterprise-wide X.500 directory service to address the message, or choose alternate delivery methods. Users could also receive work-flow information pertaining to the status of a project and

access off-line message repositories from their desktops.

But the catch is that products supporting the new services are just now becoming available, especially for the Mac. Mac managers, therefore, must familiarize themselves with the new X.400 implementation to decide when and how they will move to it.

Global mail network. Originally established in 1984 by the Consultative Committee International Telegraph and Telephone, the X.400 standard specifies a format for E-mail addresses that lets mail systems and gateways

See X.400, Page 22

Hardware to connect printers to Ethernet

COMPANY	PRODUCT NAME	PRICE	PORTS	INTERFACES
Asante Technologies	AsantePrint	\$509	LocalTalk†	thick, thin; thick, 10BASE T
Axis Communications	NPS 550	\$695	serial, 2 parallel	thin, 10BASE T
Compatible Systems	Ether-Write	\$695	LocalTalk*	thick, thin; thick, 10BASE T
Dayna Communications	EtherPrint	\$499	LocalTalk†	thick, thin; thick, 10BASE T; 3-in-one (\$50 extra)
	EtherPrint Plus	\$599	LocalTalk††	thick, thin; thick, 10BASE T; 3-in-one (\$50 extra)
Digital Products	SprintTalk/25E	\$545	LocalTalk**	thin, 10BASE T
Lantronix	EPS1	\$695	serial, parallel	thick, 10BASE T

*Supports two LocalTalk devices. †Supports up to four LocalTalk devices. **Supports up to six LocalTalk devices. ††Supports up to eight LocalTalk devices.



Asanté now takes Ethernet all the way to your laser printer.

The proven leader in Macintosh® networking now offers more Ethernet® solutions than ever. Introducing AsantéPrint™, the simplest way to connect up to 2 LocalTalk™ laser printers or other devices directly to a high-speed Ethernet network.

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AsantéPrint has no switches to set or installation software to load, so it works right out of the box. And, unlike other converters of its kind, AsantéPrint has no necessary power-up sequence. Because of this, it's the only EtherTalk-to-LocalTalk converter that is capable of unattended recovery after a power outage.

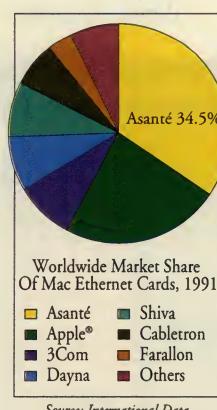
AsantéPrint is so simple, it's perfect for small networks. It's also ideal for more sophisticated networks when combined with AsantéPrint management software. This combination offers you management and security features which provide an unparalleled level of control over all your Ethernet and LocalTalk connections.

The security software assigns passwords to any or all of your connected LocalTalk devices, and even allows you to specify passwords for specific LocalTalk classes such as color printers or dial-out modems. So you can protect peripherals from unauthorized or accidental access.

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Asanté™ has a reputation for producing compatible, reliable networking products. We offer a full family of best-selling Ethernet and Token Ring® adapter cards for PCs and Macs®. And a full line of intelligent and non-intelligent 10BaseT hubs. Now we're taking Ethernet all the way to your laser printer.

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Source: International Data Corporation, June 1992

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Resellers: Asanté products are available from Ingram Micro, Merisel and Tech Data.

X.400

From Page 20

exchange messages without understanding their contents. It is compliant with the Open System Interconnection reference model for global communications and includes support for an X.25 packet-switched network or asynchronous dial-up lines.

In 1988 the CCITT revisited the X.400 specification and produced an interlocking set of new or improved functions, including transmitting and redirecting multimedia documents, tapping integrated X.500 directory services, and accessing off-line Message Store repositories. These new functions can be directly accessed from a user's desktop. Other benefits of the 1988 revision include E-mail security features and the capability to transport Electronic Data Interchange and voice mail over an X.400 backbone.

"Companies don't need to rush 1988 X.400 migration if they are personally enjoying their current setup," said Daniel Blum, principal at Rapport Communication, a consulting company in Takoma Park, Md., that developed a report on 1988 X.400 migration for the Electronic Mail Association of Arlington, Va. "But if a company is just starting from scratch and has done little with X.400 at this point," Blum said, "it would be like buying a used car to implement 1984."

Many people, however, do buy used cars. Frank Prabel, a product manager with Apple's Enterprise Systems Division, said, "More than 90 percent of X.400 customers are using components based on the older 1984 implementation."

1984 specification. In November Apple released its \$3,000, single-connection MacX.400 SD (Single Domain) and its \$5,000,

multiple-domain MacX.400 servers, both of which are based on the 1984 specification. Instead of Apple developing User Agents (UAs) to its servers, client access is provided by third-party E-mail packages that require gateways to move the mail from the Macintosh E-mail server to the Message Transfer Agent (MTA). UAs are the client components used to create and read mail, while MTAs transport the messages.

Gateways for Apple's MacX.400 servers include InterCon Systems Corp.'s Dispatcher/MacX.400 connection to CE Software Inc.'s QuickMail, as well as StarNine Technologies Inc.'s forthcoming Mail*Link gateways for QuickMail and Microsoft Mail for AppleTalk Networks. The gateways, like the Apple MacX.400 servers, are based on the 1984 X.400 implementation.

To take advantage of 1988 X.400 functionality, native UAs must reside on the Mac desktop. "Basically, migration from 1984 to 1988 will not have a big impact on products that are seeing the X.400 backbone through a gateway," Blum said.

But since existing E-mail systems will be around for quite some time, customers are likely to still value the X.400 gateways for Mac-based E-mail packages.

"People will gradually realize the benefits of native X.400 user agents, which are no degradation or loss of information through the gateways," Prabel said. "Therefore, the gateway market will start declining as the native UA market ramps up."

Prabel expects X.400 customers to migrate to 1988 specification in the 1994-95 time frame. "This is when Apple is planning to migrate to 1988. Apple will probably offer an update for customers who already have MacX.400," Prabel said.

Apple's 1988 X.400 update solutions are likely to include third-party components. "Apple is currently considering getting parts of source code from an external X.400 supplier," Prabel said, "because productizing the 1988 X.400 specs is such a vast undertaking."

First with Mac access. In July, Los Angeles-based Isocor is expected to ship what it claims is the first 1988 UA for the Mac. Iso-pro for Macintosh will bring core features such as E-mail, file transfer and multimedia document handling directly to the Mac desktop (see MacWEEK, April 12).

David Knight, Isocor vice president of sales and marketing, said that although the Mac audience is just now warming up to X.400, several companies have invested heavily to bring out 1988 X.400-based messaging servers.

Rapport's Blum said: "Most of the native X.400 products coming out are 1988-compliant. I am not even sure if there are any native 1984 X.400 products running on the Mac, just gateways. The ones coming out now are all 1988."

The Wollongong Group of Palo Alto, Calif., recently released its PathWay Messenger client, which, when used with its PathWay Messaging Services mail server, lets Mac users exchange E-mail with X.400 message-handling systems.

"PathWay Messaging supports the Message Transfer Kernel listed in the functional group profile for 1988 X.400 MTAs," said Doug Ambort, PathWay Messaging product manager, "and we are well on the way to full migration to 1988, but in no way is it a full implementation of 1988; that is just not possible yet."

WorldTalk Corp. of Los Gatos, Calif., has an X.400 gateway based on the 1988 implementation, but it still brings Mac users into the corporate backbone via Mac E-mail packages such as Microsoft Mail and QuickMail.

"Our WorldTalk 400 Gateway is a full implementation of 1988 X.400, which could be expanded," said Mark Stiegartz, vice president of marketing at WorldTalk. "But nobody has written programs that would expand even the basic new features of 1988 X.400, such as keeping track of attachment names as it goes through the gateway."

Companies must migrate. Before being able to reap the benefits of the expanded standard, companies would have to migrate to 1988 X.400 components, including messaging backbones, gateways and user interfaces.

"We had been using a 1984 X.400 gateway for MCI from Soft-Switch since 1989," said

Steve York, manager of enterprise infrastructure support at Hughes Aircraft Co.'s Long Beach, Calif.-based Enterprise Information Systems Division, which has about 1,500 Macs and 2,500 IBM PCs or compatibles. "We wanted to go to an in-house backbone, and it made sense to go with the newer 1988 standard."

York said that with native 1988 X.400 UAs and native MTAs his company did not have to contend with complicated gateway technology.

"A higher degree of functionality and robustness is possible when you don't have gateways," he said.

York said that functions his company would like to see on the desktop include support for X.500, object identifiers, transfer of multimedia documents, as well as messaging security and authentication.

"We are looking to start the process in the second half of the year," York said. "And throughput and reliability are the key things I am looking to 1988 X.400 to provide."

Companies that fail to migrate could find their mission-critical messaging systems no longer supported.

Paying the piper. The costs associated with migrating to, or building from scratch, a 1988 X.400 system can include planning and evaluation, direct purchase costs, deployment and conversion costs, maintenance costs, and costs associated with retraining users and administrators.

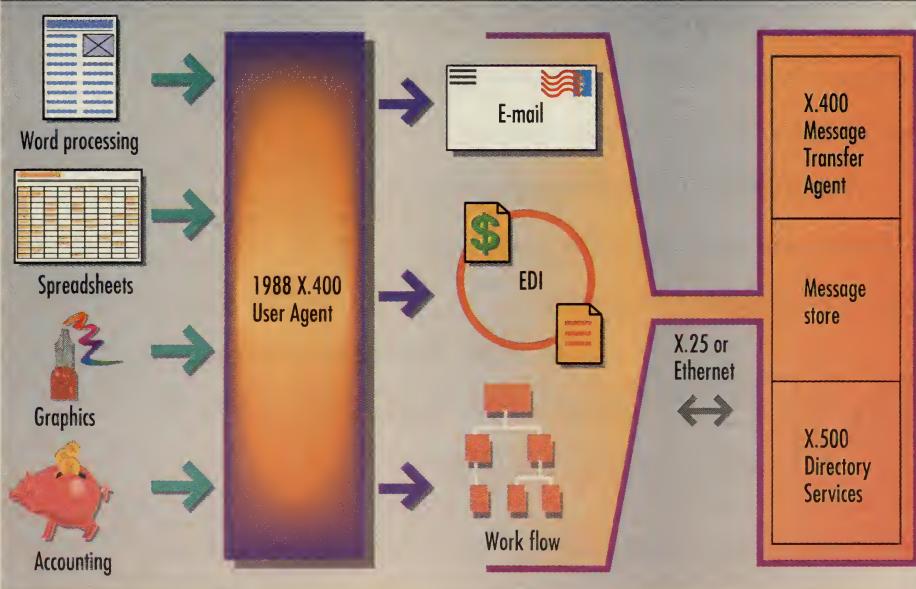
"If talking about a smaller environment, costs could be between \$5,000 to \$10,000 for a new low-end 1988 X.400 server," Rapport's Blum said. "But for a large multinational corporation with multiple gateways to many proprietary E-mail systems, it could get into six or seven figures."

Although the cost of a move to the new standard is high, companies that fail to migrate could find their mission-critical messaging systems no longer being supported.

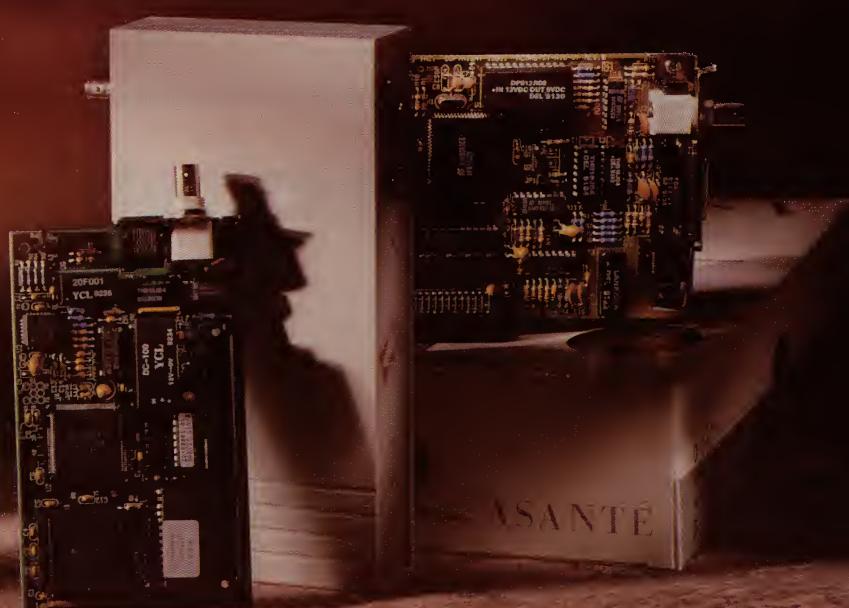
"The risks of not migrating are in several areas," Blum said. "As more and more products and trading partners start using 1988 techniques, things won't translate well." Blum said another risk is product obsolescence because older, proprietary directory synchronization utilities must be made to coexist with new X.500 products.

And for those thinking 1988 was a long time ago, you're right. In 1992 further improvements were made to the X.400 specification, but those functions will have to wait until 1988 X.400 components are in place. □

1988 standard brings X.400 services to Mac desktop



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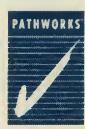
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Macintosh Networking Specialists



Microtek printer outputs in a snap

\$1,499 color device prints to Polaroid film

By Matthew Rothenberg

Torrance, Calif. — Microtek Lab Inc. has brought down the price of photographic proofing with a new continuous-tone color printer that outputs Polaroid instant prints.

Microtek also announced that last week it started shipping two new slide scanners and a transparency adapter for its ScanMaker II line.

► The SnapPrint Instant Film Printer, priced at \$1,499, outputs eight bits each of RGB (red, green, blue) data per pixel to Polaroid Type 990 High Speed Instant Film. The printer has a maximum image

size of 3.625 by 2.875 inches and a resolution of 1,024 by 500 pixels. It can output an image in 40 seconds, Microtek said; colors of the instant film are fully saturated after 30 to 40 seconds.

SnapPrint, based on the Polaroid CI-700 instant film printer engine, accommodates standard 10-packs of instant film. It includes a SCSI interface and drivers for the Mac and Windows. According to Microtek, the printer requires System 6.0.5 or later and at least 5 Mbytes of RAM.

Microtek's new printer will compete against the Kodak 450GL from Eastman Kodak Co. of Rochester, N.Y. Kodak's \$1,729 QuickDraw printer outputs eight bits each of CMY (cyan, magenta, yellow) or gray-scale data per pixel to special

thermal paper and handles images measuring up to 3.94 by 5.51 inches. Photos take about 45 seconds to render and 45 seconds to print and cost about 90 cents each (see MacWEEK, April 5).

► The ScanMaker 45t, available for \$7,999, captures transparencies ranging from 35mm to 5 by 5 inches at a hardware resolution of 1,000 dpi, which can be increased to 2,000 dpi via software interpolation.

The ScanMaker 45t includes CCD (charge-coupled device) sensors that can capture 12 bits each of RGB or gray-scale data per pixel in a single pass. Automatic gamma controls select the best eight bits each of RGB information for the final image, Microtek said.

The ScanMaker 45t can capture an image at maximum size and resolution in five minutes, 20 seconds, the company said (see MacWEEK, March 22).

► The ScanMaker 35t, priced at \$1,999, handles 35mm color slides at an optical resolution of 1,832 by 1,832 pixels, which can be interpolated to 3,656 by 3,656 pixels. It ships with a device profile for Apple's Colorsync system extension for device-independent color matching.

► The Transparent Media Adapter, shipping now for \$799, replaces the standard lid of Microtek's ScanMaker II flatbed models and draws power from the scanners' automatic document feeder option port. The adapter lets users scan transparencies as large as 8 by 10 inches in 24-bit color, Microtek said.

Microtek Lab Inc. is at 680 Knox St., Torrance, Calif. 90502. Phone (213) 321-2121; fax (213) 538-1193. □

See Media Suite Pro, Page 27

New Media Suite Pro supports QuickTime movies, animations

By Neil McManus

Tewksbury, Mass. — Avid Technology Inc. last month released a new version of its low-end digital video-editing system that supports QuickTime movies and animations.

Media Suite Pro 1.10, now shipping for \$9,995, is a nonlinear video-production system for producing industrial-quality tapes. The Mac-based system lets users capture, edit and output full-screen video at 30 frames per second.

The Avid system includes a custom version of Truevision Inc.'s NuVista+ NuBus board, an Avid image-compression board based on the JPEG (Joint Photographic Experts Group) standard, Digidesign

Inc.'s AudioMedia II board, ATTO Technology Inc.'s SCSI-2 board and Avid's Media Suite software.

Version 1.10 lets users include QuickTime movies and animations in their productions. It also adds import support of Scrapbook files and import and export of AIFF (Audio Interchange File Format) audio files. A new Import Many command simultaneously imports multiple PICT files.

The new version adds support for NTSC and PAL (European) video standards. The system is now available in English, French, German and Italian. A kanji version is due this fall.

See Media Suite Pro, Page 27

Avid's Media Suite Pro comes with a program that lets users create anti-aliased titles. Version 1.10 supports color and transparency gradients.



Avid's Media Suite Pro comes with a program that lets users create anti-aliased titles. Version 1.10 supports color and transparency gradients.

Kodak's Shoebox organizes Photo CD images

By Connie Guglielmo

Rochester, N.Y. — Eastman Kodak Co. last month released new software designed to give Macintosh users a way to quickly index and catalog Photo CD images.

Kodak Shoebox, developed by Seattle-based PhotoDisc Inc., lets users index, catalog and search thumbnail versions of Photo CD images through user-defined fields, keywords and captions. While users search through low-resolution thumbnails, Shoebox retrieves in

whatever resolution users specify.

In addition to retrieving Photo CD images from disc, users can work with PICT, TIFF and Encapsulated PostScript images, as well as QuickTime movies and AIFF (Audio Interchange File Format) audio files.

Indexed images are stored in catalog files, with each catalog capable of referencing more than 30,000 files. Multiple catalogs can be opened at once. "Catalogs are great because you can save all the images from a specific project in one cata-

log," said beta-tester Lou Beach, co-founder of Brains, a Los Angeles-based design company.

Shoebox also includes the capability for multimedia slide shows. "With slide shows," Beach said, "you can have images come up one at a time or overlap and play sounds while the pictures are showing."

Shoebox, retailing for \$345, will be available for \$99 until Aug. 31.

Eastman Kodak Co. is at 343 State St., Rochester, N.Y. 14650. Phone (800) 242-2424, Ext. 53. □

Get The Picture from Information Presentation Technologies lets Mac users access a database of TIFF and Encapsulated PostScript images across Ethernet and LocalTalk networks.



IPT's Get The Picture database lets Macs tap Sun image server

By Kirsten L. Parkinson

San Luis Obispo, Calif. — Information Presentation Technologies Inc. is now shipping Get The Picture, a networked image-database system with Mac client support.

With Get The Picture, Mac clients can browse, copy and print TIFF and Encapsulated PostScript images stored on a Sun SPARCstation connected to an Ethernet or AppleTalk network.

The \$8,995 system includes the company's Image Browser client application for 25 Mac users and several SPARC programs for database management as well as image spooling and printing.

When logging a new graphic into the Get The Picture database, users can specify a title, description and categories for the image. The program automatically creates a thumbnail and calculates and records the picture's resolution, physical dimensions, who logged it in and the most recent backup date. Users can then search for

thumbnails by any combination of this data.

Get The Picture automatically substitutes the high-resolution original for a pasted thumbnail when printing, and the company's included Open Prepress Interface software prints the image at the best resolution for the selected output device.

Get The Picture also provides four levels of database password protection and the capability to browse only; add, modify and delete images; add new image categories; and set access privileges for other users. A log feature stores every action of the database in a single file for reference.

A future version of the product will add reporting capabilities for tracking activities such as how often each image has been used. DOS, Windows and NeXTstep 486 clients will ship this summer.

Information Presentation Technologies Inc. is at 555 Chorro St., San Luis Obispo, Calif. 93405. Phone (805) 541-3000; fax (805) 541-3037. □

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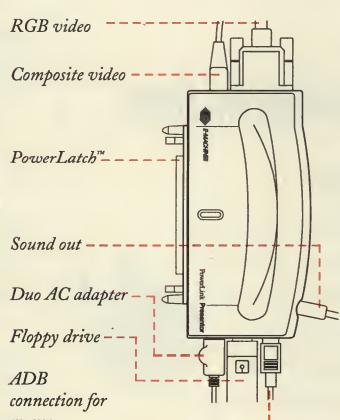


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Painter branches out with foliage library, tutorial

By Kirsten L. Parkinson

Aptos, Calif. — Fractal Design Corp. next month will add foliage to its Painter 2.0 application with the shipment of Trees & Leaves, an add-on library of Brush Looks.

The company last month also unveiled a Painter 2.0 tutorial package and a version of

Painter/X2 for the Windows platform.

► **Trees & Leaves**, Fractal's first library of Brush Looks, incorporates 24 predefined combinations of brushstroke sizes and textures resembling plants such as fern and ivy.

The \$29.95 set requires Version 2.0 of Painter, which retails for \$399.

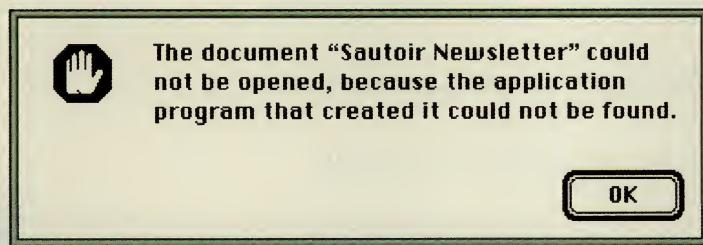
► **Painter 2.0 Companion** provides a book with samples of Painter artwork as well as a disk of Painter playback sessions showing users how to create certain effects and use various Painter tools, including friskets, lighting features and liquid media techniques.

Painter 2.0 Companion is now shipping free to registered Painter 2.0 users.

► **Painter X/2 for Windows**, which will ship next month, is a \$149 Painter 2.0 add-on. Like the Mac version due this month, Painter X/2 for Windows will add multiple layers, unlimited friskets and a portfolio feature for storing images (see MacWEEK, April 5).

Fractal Design Corp. is at 335 Spreckels Drive, Aptos, Calif. 95003. Phone (408) 688-5300; fax (408) 688-8836. □

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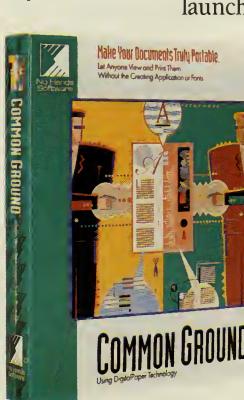


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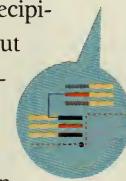
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Gazelle Technologies' clip art CD-ROM contains a number of 24-bit images of scenic locations.



MacPresents 1.1 adjusts resolution

By Lisa Picarille

Minneapolis — Educational Multimedia Concepts Ltd. is shipping an upgrade to its MacPresents — Multimedia Presentation Manager that supports a variety of screen resolutions, System 7.1, and the latest versions of QuickTime and Macromedia Director.

Version 1.1 of MacPresents is designed to help users organize and manage multimedia presentations. The program includes facilities that streamline the handling of a variety of file types, such as text, graphics, video, animation and sound.

Because MacPresents is aimed at users who want to pull together presentations quickly, it lacks many features found in most popular presentation-graphics products, such as outlining, speaker's notes and handouts, global backgrounds, and slide transitions.

To assemble presentations with MacPresents, users arrange items in as many as six pull-down menus of distinct file types. These items are then loaded into a script file that

defines the sequence of slides within the presentation. Each presentation is stored as a separate script menu.

The script menu also lets users navigate through presentations and jump to any point within the presentation.

MacPresents includes a built-in HyperCard application of text and black-and-white painting tools. A controller for previewing and selecting material from videodiscs is also included.

Version 1.1 also supports multiple screen resolutions, which enables users to specify the type of monitor on which presentations will be viewed. In addition to the previous release's support for 640-by-480-pixel screens, Version 1.1 works with PowerBooks and large-format monitors.

The program, which comes with a license for two concurrent users, is priced at \$349 and discounted to \$299 for educational customers.

Educational Multimedia Concepts Ltd. is at 1313 Fifth St. S.E., Suite 202E, Minneapolis, Minn. 55414. Phone (612) 379-3842. □

LaserMaster color inkjet outputs to 36" x 110"

By Matthew Rothenberg

Eden Prairie, Minn. — LaserMaster Corp. last month shipped an oversize inkjet printer the company hopes will make a big splash in PostScript output.

The DisplayMaster Digital Color printer, available for \$17,995, outputs four-color images to paper or transparencies measuring as large as 36 inches wide and 110 inches long. It prints up to 20.4 square inches per minute at a maximum resolution of 300 dpi, the company said.

The printer automatically switches between the Level 2 version of Pipeline Associ-

ates Inc.'s PowerPage PostScript interpreter and an HP-GL/2 emulation, and it comes with 235 Type 1 fonts on a 220-Mbyte internal hard disk. It includes simultaneously active Ethernet, LocalTalk, Centronics parallel and RS-232C serial ports.

The LaserMaster device includes a proprietary 66-MHz processor with a floating-point unit and 48 Mbytes of RAM, which can be expanded to 256 Mbytes. It also comes with 264 Kbytes of fast-cache RAM.

LaserMaster Corp. is at 6900 Shady Oak Road, Eden Prairie, Minn. 55344. Phone (612) 944-9457; fax (612) 943-3469. □

CD-ROM SIMPLIFIES COLOR DESKTOP PUBLISHING

Toronto — Users trying to get a grip on color desktop publishing can turn to ColorExpert 1.0, a new reference CD-ROM that explains everything from scanning images to final press approval.

Available now for \$395 from ColorExpert Inc., the interactive HyperCard-based guide

studies color and pre-press through text, images and QuickTime animations. The CD-ROM also contains test files, such as a printer capability test.

The disc contains 49 topics grouped into 10 chapters, including Light and Color, Original Material, Scanning Concepts, Production Concepts, Imagesetting, Proofing, Printing, and Troubleshooting.

In addition to the CD-ROM, the package comes with a 64-page color booklet containing proof-press output.

ColorExpert Inc. is at 555 Richmond St. W., Suite 504, Toronto, Ontario M5V 3B1, Canada. Phone (416) 360-3894; fax (416) 360-0204.



Media Suite Pro

From Page 24

The system's titling program can now handle color gradients and transparency gradients. It can also align objects to grids.

In addition, Media Suite Pro now controls all tape decks supported by Videomedia Inc.'s V-LAN device controllers.

Media Suite Pro runs only on a Mac IIfx or Quadra 900 or 950. The minimum storage requirement for Media Suite Pro is a

2-Gbyte hard drive, which can hold 30 minutes of video and CD-quality sound, Avid said. The system can support seven drives holding three and a half hours of audio and video.

Upgrades to Version 1.10 are free to registered users.

Avid Technology Inc. is at Metropolitan Technology Park, 1 Park West, Tewksbury, Mass. 01876. Phone (508) 640-6789; fax (508) 640-1366. □

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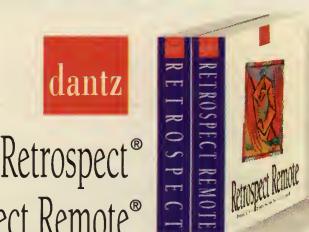
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BUSINESS WATCH

- Industry news
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Apple loses suit, vows to appeal

Refuses to concede in 5-year copyright feud

By Jon Swartz

San Francisco — After investing five years in judicial maneuvering — not to mention millions of dollars in legal costs — Apple last week officially lost its copyright-infringement suit against Microsoft Corp. and Hewlett-Packard Co.

For now, at least.

U.S. District Judge Vaughn Walker, who in recent weeks has severely narrowed the scope of Apple's case, dismissed all remain-

ing Apple claims last week.

A jury trial set for June 28 had been removed from the court calendar with the approval of the three companies, paving the way for Apple to avoid a costly trial and appeal the case instead.

Edward Stead, Apple's general counsel and vice president, said the company would immediately appeal the case to the 9th U.S. Circuit Court of Appeals. "We think the District Court was wrong in treating Apple's distinctive copyrighted [interface] as a 'purely functional arrangement,'" Stead said in



a statement. "We think it is important that innovative graphical computer works receive the protection to which they are entitled under the copyright law."

Microsoft and HP, meanwhile, lauded the decision. "We are gratified that we have prevailed," said William Neukom, vice president of law and corporate affairs at Microsoft.

Walker last month tapered the case to essentially one issue: whether Windows' appearance is identical to the interface of Apple's

See Suit, Page 30

Dealers don't worry about catalog

By Jon Swartz

Cupertino, Calif. — The summer edition of Apple's mail-order catalog isn't likely to make dealers sweat, despite a larger selection of Macintoshes and printers.

In addition to the PowerBook 145 and 160 models, which have been available since the catalog debuted last fall, the 56-page catalog now offers the Color Classic, LC III, PowerBook 165c, PowerBook Duo 210, Apple IIe and Centris 610 — all at retail price.

At the same time, Apple is widening the catalog's selection of printers, adding the LaserWriter Select 310,

LaserWriter Pro 600 and 630, and Apple Color Printer to the StyleWriter printers it currently offers.

The catalog continues to carry discounted third-party software from Claris Corp., Aldus Corp. and others.

But dealers said the catalog's growing list of Mac CPUs, printers and software isn't likely to interfere with their sales, since all the catalog's hardware items are listed at full retail price.

"I don't think it either hurts or helps us," said Mike Cahn, branch manager of Inacomp Computer Center of Denver. "I'm not sure cus-

See Catalog, Page 30

TechGnosis trademarks network term

By Jon Swartz

Boca Raton, Fla. — TechGnosis Inc. last month laid legal claim to an increasingly used networking buzzword.

The company, based here, said it has been granted a registered trademark by the U.S. Patent and Trademark Office to the term "client/server/middleware," a technology it helped introduce in 1987 with its Sequelink product. However, officials added they will probably not pursue royalties and licensing fees for use of the phrase.

"We'd like to see our company name more closely associated with a growing technology field — just like Sybase [Inc.] coined the phrase client/server," said William Sullivan, vice president of sales and marketing at TechGnosis. "We want to gain additional mind share."

Sullivan said the company is toying with the idea of changing its name to TechGnosis Middleware Inc. Meanwhile, the private, 80-person company is in the process of moving its marketing, support and distribution operations to Boston, where it may relocate its headquarters by the end of the year, Sullivan said.

TechGnosis reported sales of about \$10 million for its fiscal year 1992. □

MacWEEK index INTERNATIONAL SOFTWARE SUPPORT

How do U.S. software developers provide international service and support? Although they put a premium on domestic support, most do not offer comparable services abroad, according to a recent survey. Below is the percentage of companies offering certain kinds of support.

	EUROPE	ASIA	REST OF WORLD
Channel partners	54	44	52
U.S. support centers	39	40	47
Local support center	25	9	8
Local republisher	17	13	11
Country-by-country support center	10	7	6
Contract out support	5	5	5
No office there	24	38	35

Source: Software Publishers Association.

AT&T looks to a handheld future, acquires majority stake in EO

By Lisa Picarille

Basking Ridge, N.J. — AT&T Co. is aiming to make handheld computing devices as popular as the telephone.

To that end, AT&T is placing its bets on nearly every major player in the fledgling handheld computer and wireless communications market.

Last week the telecommunications giant increased its investment in EO Inc. of Mountain View, Calif., to 51 percent, up from 20 percent.

Industry observers said AT&T's majority ownership and a joint marketing pact with EO gives the 2-year-old start-up strong marketing and distribution muscle for its personal communicators, which combine cellular phone, fax, electronic-mail and portable computer technology.

Under terms of the deal, EO is allowed to put AT&T's name on its personal communicators, due to

ship this summer. EO also has access to AT&T's communications technology and services and its prodigious sales channel.

The deal is considered a boon for EO, which despite undisclosed equity investments from Japanese investors Matsushita Electric Industrial Co. Ltd. and Marubeni Inc., faces competition from Apple and Tandy Corp.

For its part, AT&T now has equity investments in several handheld developers, including pen-based device maker General Magic, also of Mountain View.

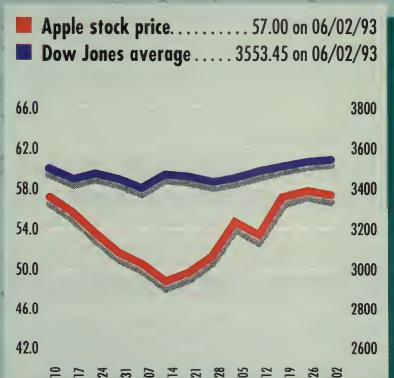
AT&T's financial reach also extends to 3DO Co., a San Mateo, Calif.-based start-up that is developing a multimedia video game player; Sundisk Corp., a Santa Clara, Calif., developer of credit-card-size data storage devices; and McCaw Cellular Communications Inc. of Kirkland, Wash. □

StockWatch

	06/02/93 CLOSE	WEEKLY % CHANGE
Apple	57.00	-1.30
SOFTWARE DEVELOPERS		
Adobe	65.88	-6.89
Aldus	16.25	1.56
Caere	7.88	-1.56
CE Software	4.00	10.34
Microsoft	95.75	0.52
Novell	28.88	-3.35
Symantec	17.50	-3.45
PERIPHERALS VENDORS		
CMS	3.00	-14.29
HP	85.88	-0.43
QMS	9.75	-40.00
Radius	3.38	-3.57
RasterOps	9.25	12.12
Sigma	4.00	-23.81
SuperMac	24.25	10.23
STORAGE		
Conner	11.75	-2.08
Maxtor	7.13	0.00
Quantum	12.25	-2.97
Seagate	16.38	-2.24
SyQuest	14.75	11.32
INDUSTRY INDICATORS		
DEC	44.13	-2.49
IBM	53.88	2.13
Motorola	84.38	2.12
Sun	31.25	2.04
Dow Jones	3553.45	0.38

Compiled by Nordby International Inc.

Shares in both Microsoft Corp. and Hewlett-Packard Co. rose sharply on Tuesday following news that Apple's copyright case against the two companies had been dismissed. Microsoft jumped \$3.63



HP down despite dismissal of Apple suit



for the day, while HP gained \$2.25. For the week, however, Microsoft's stock inched up less than 1 percent to close at \$95.75 per share, while HP's stock slipped less than 1 percent to \$85.88.

Why buy any other display when you can now get a 15" PrecisionColor™ Pivot® for just \$1149. It's like getting two great displays for the price of an ordinary one.

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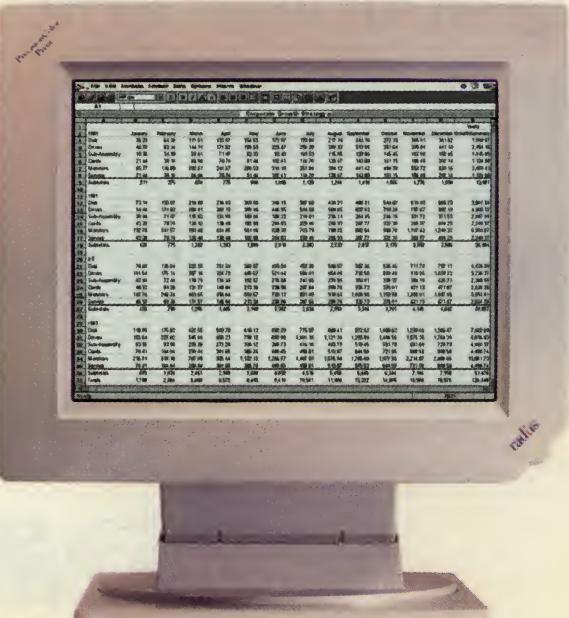
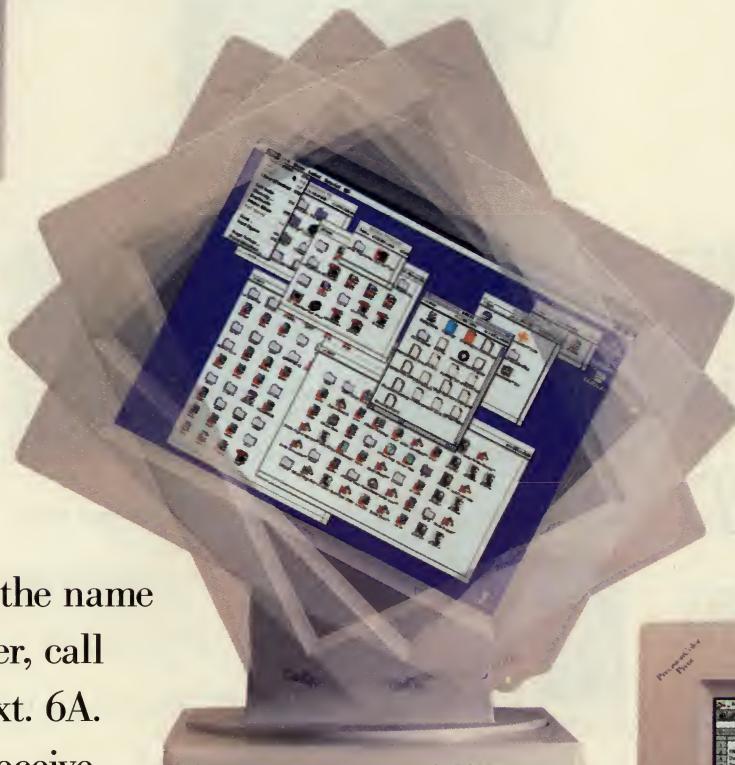
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Suit

From Page 28

Lisa, a predecessor to the Macintosh. Walker ruled that a jury could not consider any of the 189 software features that Apple originally contended had been copied by Windows and could consider only four of the 147 HP New Wave features (see MacWEEK, May 24).

Legal observers said an appeal is likely to prolong the copyright suit another two years. "Apple is in this thing for the long haul," said

Frederick Cooper III, a copyright lawyer based in Norcross, Ga.

Microsoft and HP plan to ask Walker to order Apple to pay their legal costs because they claim the suit was brought in bad faith and violated a 1985 licensing agreement between Apple and Microsoft. Observers said legal costs total millions of dollars.

Apple attorney Chris Ottenweller said Apple would strongly oppose paying legal fees. □

Catalog

From Page 28

tomers buy anything more than sweaters and mugs — especially after they check out prices of the catalog's products."

However, Apple reportedly is considering offering several of its catalog products at discount prices by the end of the year, sources said.

An Apple USA spokeswoman declined to comment on the company's future catalog plans. □



Business

BRIEFS

3Com stock takes hit

Santa Clara, Calif. — Shares in 3Com Corp. dove nearly 30 percent last week after a brokerage firm issued a negative report about the pace of the networking company's orders.

3Com stock plunged \$11.50 to \$27 per share after Thomas Erickson, an analyst at Wessels, Arnold & Henderson, removed 3Com, based here, from the Minneapolis firm's list of recommended buys.

However, Wall Street analysts quickly called the selling overdone and stressed 3Com's bright long-term prospects.

A 3Com spokeswoman also said the market was overreacting but acknowledged that orders are slow at the moment.

Conner warns of Q2 loss

San Jose, Calif. — Conner Peripherals Inc. last week said it expects to report an operating loss for its second quarter ending June 30.

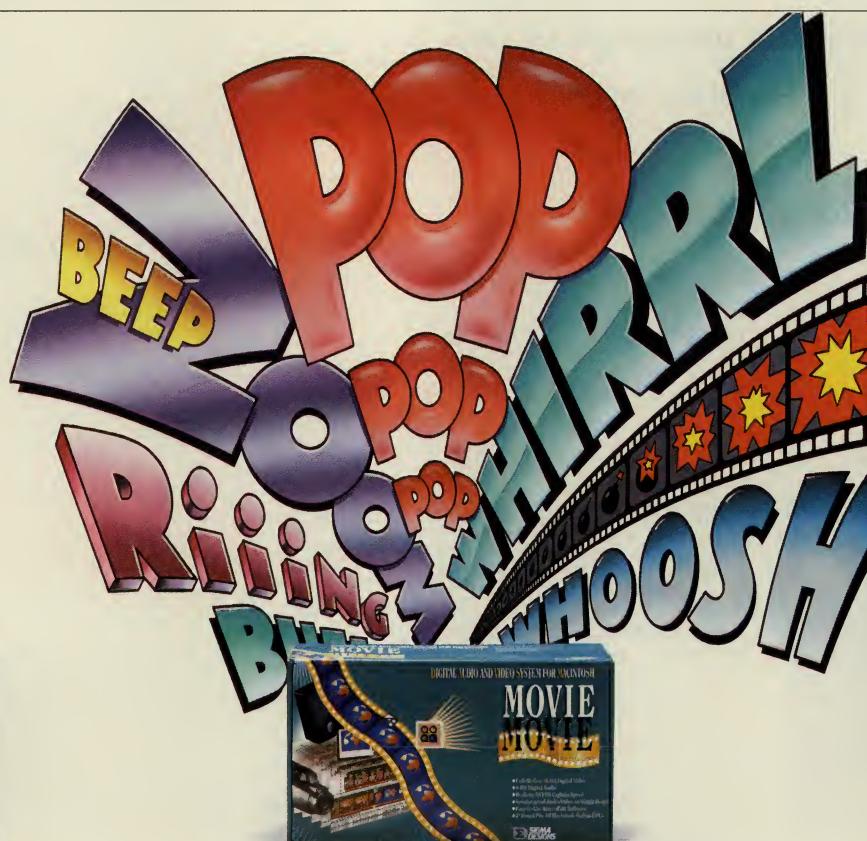
The drive maker, which would not disclose the amount of the loss, blamed stiff price competition, an excess of products in inventory and a shift in demand to drives with more than 200 Mbytes.

Conner said it expects its fortunes to change during the fourth quarter based on projected growth in its storage solutions business, ongoing companywide cuts and the introduction of new products.

Focus Enhancements goes public

Woburn, Mass. — Focus Enhancements Inc., a 35-person peripherals and networking mail-order company here, this week completed an initial public offering of 1.5 million shares.

The offering, underwritten by Thomas James Associates Inc. of Rochester, N.Y., fetched an initial price of \$4.25 per share. The company's stock will be traded on NASDAQ under the symbol FCSE.



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EDITORIAL

Don't write off the pen

It's easy these days to pooh-pooh pen-based computing, but dismissing the pen out of hand is as shortsighted as proclaiming the keyboard obsolete.

That's why we look forward with enthusiasm to Apple's impending entry into the field, through the Newtons and a line of pen-based Duos it will soon begin test-marketing with corporate customers. And it's why we think last month's announcement of a multivendor standard for "digital ink" — the raw data generated when users write on pen-based devices — marks a major milestone.

Outside of a few vertical niches, customers have been slow to buy into pen computing. The reasons are not hard to fathom: Pen-based computers have been too heavy and too expensive, their handwriting recognition capabilities have been too limited, and good tools for creating pen-oriented applications have not been available.

Whether these problems have now been overcome sufficiently to generate a real mass market, we don't know; that's why Apple's cautious, toe-in-the-water approach makes

sense. But sometime soon — if not 1993, then next year or the year after — electronic tablets won't weigh much more than their paper forerunners, and they'll be able to reliably turn casual scrawl into digital data. At that point we think the pen will be most users' tool of choice for tasks such as note taking, call logging and possibly even messaging.

Hence the importance of the new Jot specification. Because it provides a format for storing data such as pen direction and stroke sequence along with pen-generated bit maps, it will allow users to exchange ink across Jot-compatible platforms, converting it to digital form if, when and where they choose.

We were glad to see Apple among the spec's initial endorsers, and we trust the company will move quickly to support it, both in the Newtons and in pen Macs. With leading pen developers behind it, Jot seems destined to become the ASCII of ink. That can only help speed the arrival of a technology that, despite past disappointments, is sure to play a critical role in the emerging era of mobile computing. □

My Turn by Paul Saffo

Paperless office: Paper gluttons need not worry

MacWEEK this week launches a new round-robin column in which five commentators will take turns presenting their perspectives on the Mac and the computing scene. First in line is Paul Saffo, a research fellow at The Institute for the Future, a technology think tank in Menlo Park, Calif. — Ed.

The "paperless office" — that hoariest of information-age myths — is making a comeback. Later this week Microsoft Corp. will announce a new Windows-based "digital office" standard for linking personal computers with office tools such as copiers and fax machines. Already analysts are talking about how great it will be to put document-swapped workers on a low-fiber diet.

Paper gluttons needn't worry. Systems like Microsoft's digital office will increase paper consumption by transforming it into a versatile display and control medium. Instead of substituting electrons for fiber, we are making paper the most essential of our computer peripherals.

Paper trails. It turns out that the computer has been paper's best friend. Intended to replace it, machines ended up generating more of the stuff than ever. Copiers automated duplication, laser printers made the creation of originals a snap. Not surprisingly, the consumption of paper has grown faster than the gross national product virtually every year since World War II.

The paperless office seems plausible only because we forget that, for most of its history, paper has been more important as a storage medium than as a display vehicle. Documents typically are read in an instant before spending an eternity entombed in file cabinets.

Now paper is becoming interface. Systems like Microsoft's digital office will get us in the habit of storing documents electronically, printing them on demand and promptly recycling them when we are done. Filing cabinets may be headed for the scrap heap, but we will be swamped with more paper than ever. Instead of 60-pound bond, we'll need 60-day bond, paper that decomposes into fiber mulch for our gardens.

Origami. But viewing is only half of the paper-interface equation. Increasingly, the audience for our documents will be computers, copiers and fax machines.

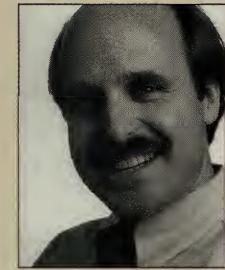
Paper will even become an interface between machines. For example, Xerox Corp.'s new Glyph technology (likely to be a

key part of Microsoft's new product) encodes information on paper in a form readable only by machines. As scanner resolutions increase, it will be possible to make Glyph information invisible to human eyes, hiding it, for example, inside a halftone photo.

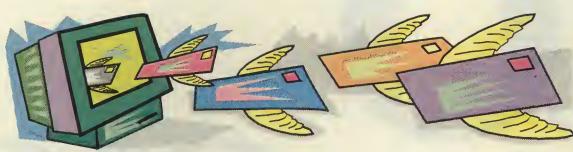
Until now, putting information on paper was a one-way trip. For example, printing a portion of a hypertext document today severs all the links that make hypertext valuable. Once severed, the information is dead — a fly in amber. But encode a message to the computer on the printout with Glyph, and suddenly the computer links can travel with the human-readable text.

Of course, even this brave new technology is simply a transition to yet greater surprises lurking in the wings. Researchers are already working on "digital paper," a computer and ultra-high-resolution display contained in a thin sheet with the feel and flexibility of a sheet of parchment.

In this regard, the enthusiasts are right: Our offices eventually will become paperless. But I doubt it will happen any time before the second term of the Chelsea Clinton administration. Until then, buy stock in paper mills. Oh, and buy another laser printer. □



LETTERS



Mac is the majority flavor of choice at Ben & Jerry's

The story "Two big sites stop Mac purchases" (MacWEEK, April 12) about how some big corporations are banning Macs caught my eye. I'm the Mac guru at Ben & Jerry's Homemade Inc. I know we're not a really big corporation (just over \$100 million in sales), but we definitely don't take that approach.

We would never be so totalitarian as to decree what platform to use. We leave that up to the departments. Right now Macs outnumber DOS/Windows machines about 3-to-1. We are building a state-of-the-art ice cream plant in St. Albans, Vt. This plant will be completely controlled by Macs.

While we don't tell people they have to use Macs, it is encouraged. Only the sales department has told its users they have to use Windows, but we still have one holdout in the department who uses a Mac LC III.

*Joe Wilkins, Mac guru
Ben & Jerry's Homemade Inc.
Waterbury, Vt.*

Apple points to third parties for 16MB SIMMs for IIvx

In response to the letter "Customer judges RAM scam worthy of complaint to FTC" (MacWEEK, April 5), I want to confirm that, in fact, 16-Mbyte SIMMs are available for the Mac IIvx and have been since the introduction of the Quadra 700.

To reconfirm the availability of these memory upgrades in the marketplace, we have checked to verify that Microtech International Inc. and Newer Technology supply 16-Mbyte SIMMs compatible with the Macintosh IIvx.

I hope this information will reassure any readers who may have become concerned about the possibility of upgrading the Mac IIvx.

*Jackie Whiting
Director of customer support
Apple USA
Cupertino, Calif.*

Photographer wants standard that includes a human factor

I would like to address the issue of going to a standardized format as discussed by Robert Caspe of Leaf Systems Inc. in the story "Should Mac users switch to 48-bit-color standard?" (MacWEEK, May 3).

It seems Caspe is asking us to go beyond simply replicating digitally the traditional color execution of old. He is attempting to move us into a whole new world of true WYSIWYG, meaning replication of what

the human eye perceives and its broader values rather than what is available within known reproductive values.

I salute his futuristic ideas, but he left one thing out of his hypothesis. That is, until the dynamic range of current professional films expands beyond 5 to 6 f-stop latitude, there will be no way to transfer to a scanner the 11 f-stop or 14-bit dynamic range information he speaks of unless it is done digitally in-camera.

This means that to support Caspe's enlarged dynamic range, we photographers can look forward to walking around with lenses the size of five-gallon buckets in the future.

Please, let's adopt a standard that might not be the broadest dynamic range but is one that is acceptable to the trained human eye and affordable to the human pocketbook.

*Ron G. Tussy, photographer,
digital imager and publisher
Ron G. Tussy & Associates
San Mateo, Calif.*

Ongoing rush of new models clouds choices for Mac junkie

After using a Mac Plus for several years, I purchased a Mac IIxi about a year and a half ago. I felt as if I was finally at the leading edge of the technology.

Now I'm faced with a dilemma shared by many other people: Should I purchase a new computer now or wait for a few months for newer models to appear? Should I upgrade my IIxi by adding more memory and an accelerator? Does it make sense to spend more money on an obsolete computer? Since the IIxi still does the job for me, is it really obsolete?

When Apple came out with new models just once a year or so, deciding which Mac to buy and when to buy it was a fairly simple task. You knew that whichever model you selected would be good for a year or so. Now that Apple is announcing new models every few months, Macs seem to get old faster than you can buy them.

I should probably be thrilled when Apple announces new models, but these new models are also a reminder of how old my computer has instantly become. I admit that I'm a computer junkie. I feel I must have the latest equipment, whether I need it or not. But the reality is that I just cannot afford to keep up any longer.

*Ryoichi Morita
Madera, Calif.*

Send letters to MacWEEK, 301 Howard St., 15th Floor, San Francisco, Calif. 94105. MCI 323-1203; Internet, letters@macweek.ziff.com; fax (415) 243-3650. Include your name, address and phone number. Letters should not exceed 300 words. We reserve the right to edit for clarity and length.

The Mac Manager

Windows NT: A lesson in forgetting customers

of RAM and 75 Mbytes of free hard disk space just to hold its files.

Ouch redux! Remember when we complained that System 7 needed at least 2 Mbytes of RAM to work properly?

At those cost levels, you have to ask yourself whether NT really provides enough added value. A great number of Windows customers will find NT fails that basic test. Likewise, you can pretty much forget about any movement of straight DOS folk to NT.

The arrogance of Microsoft.

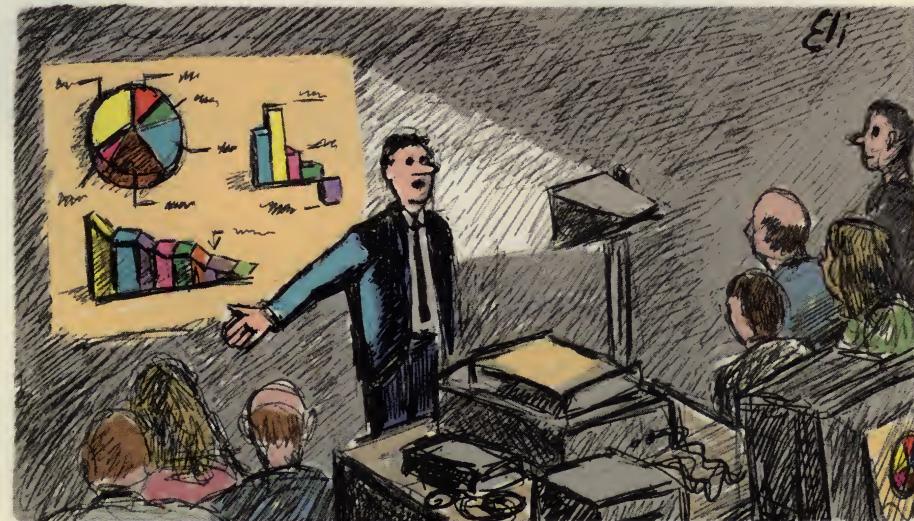
Microsoft's customers, a group to which most Mac managers have long belonged, have already started to complain vigorously about the implementation cost of NT. They argue that NT is simply the System 7 of Windows and, therefore, should be priced as an upgrade fee. They also argue that Microsoft bit off far more than it can chew by trying to take on Unix, PowerOpen and OS/2 with NT.

Microsoft, of course, sees the situation differently. To recoup its reported \$150 million development tab, NT has to cost users serious money. And if Microsoft hopes to extend its reach onto workstation desktops and fight off the incursions that Unix and the Mac are making into the world of Intel-standard microcomputing, creating NT was a corporate no-brainer.

The bottom line is that Microsoft's needs have diverged considerably from its customers' needs. The company, with its usual arrogance and clout, will attempt to force its views on its customers, just as it has in the past. But that should remind all of us that there are very good reasons why we do business with Apple, warts and all. □



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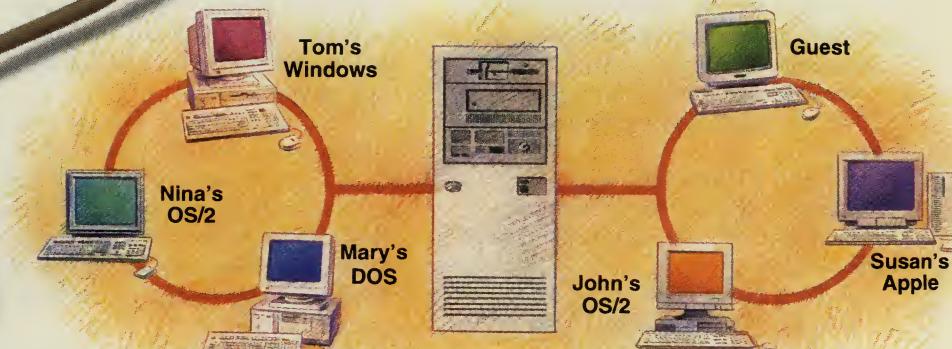
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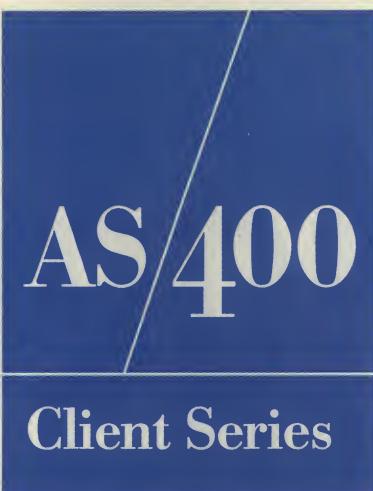
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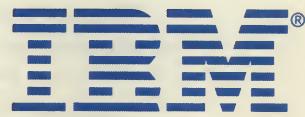
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MASS STORAGE

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More memory on the road
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**Disk arrays —
more storage, more speed**
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CHAD KUBO

The gigabyte is the new metric of high-end Mac storage, and in this Special Report we examine how large-capacity magnetic and optical drives are moving into the mainstream. We also look at expanding hard disk options inside PowerBooks and the computer-data futures of two technologies, the MiniDisc and Digital Compact Cassette.

High-capacity hard drives flood mass-storage market

By Mitzi Waltz

Plenty of Mac users could use a 1-Gbyte hard drive these days, what with ever-expanding applications, bulging System folders and huge graphics files. As the number of users who need to have multiple megabytes of data close at hand has grown and the prices of hard drives have declined, vendors have seen an increase in sales of large-capacity drives over the past year that they describe as nothing less than phenomenal.

"One-gig drives have become a commodity-driven item faster than anything I've ever seen in my career in mass storage," said Kevin Perry, director of product development and marketing at Microtech International Inc.

Among the companies that manufacture large-capacity mechanisms are Quantum

Corp., Maxtor Corp., Seagate Technology Inc., Fujitsu Computer Products of America Inc., Toshiba America Information Systems Inc., Micropolis Corp. and Hewlett-Packard Co.

Available sizes range from basic 1-Gbyte models all the way up to Seagate's latest top-of-the-line Elite drive, which offers a whopping 2.9 Gbytes when formatted.

What are users doing with all that space? These drives are finding homes as file servers, as the keepers of huge databases, and as repositories of color graphics and layouts generated by pre-press applications.

They are also invaluable for video, audio and multimedia professionals, who have been early and enthusiastic purchasers. For these

users, the amount of storage needed depends on the production system in use and the level of quality desired. In video production, for example, storing 30 seconds of low-end video on-line requires 8 to 16 Mbytes. For high-end work, such as video produced on an Avid system at AVR 5 video-quality level, 25 minutes of video requires at least 2 Gbytes of space, while storing CD-quality sound demands about 10 Mbytes per minute.

High-capacity drives at work. "I have three systems set up with 8 to 10 Gbytes apiece, and I'm currently working on a 100-Gbyte array," said Rick Eye of Digital Video Technology in Burbank, Calif. (Eye is a digital-video consultant for major studios in Los Angeles).

But buying a drive is not as straightforward as it seems.

"I look at the speed of the platter and transfer speed more than seek times," Eye said, adding that spindle speeds of 5,400 rpm and higher are mandatory.

Advertisements can be confusing. Sustained data transfer rates are a better basis for comparison than the "burst" transfer speeds sometimes used.

And drives should work not only with standard SCSI ports but also with accelerated SCSI cards, such as ATTO Technology Inc.'s Silicon Express NuBus card, Eye added.

Buyers of the largest high-capacity drives are sometimes surprised to learn that the Macintosh operating system can't recognize any storage device with a capacity that exceeds 2 Gbytes.

To use larger drives, users must partition them. "That's not a huge problem if you structure your files into nice, neat categories,"

Eye said. "Setting up a file structure right from the beginning is important anyway because things can get lost."

Users should also be aware that the Macintosh's file system divides drives into 65,536 "allocation blocks," each of which can hold only one file. As drives get bigger, the size of these blocks balloons to as much as 32 Mbytes, leading to wasted space when storing smaller files. Partitioning, which turns a single drive into two or more discrete volumes, lowers the size of the blocks.

Apple's operating system is likely to support large volumes in the future, said James Porter, president of Disk/Trend Inc., a Mountain View, Calif.-based market research company. But buyers shouldn't hold their breath. "From the first Macintosh on, Apple has seriously underestimated the storage needs of its users," he said. With the new Mac servers, he added, "they have to be thinking along these lines at last."

Thermal recalibration. For multimedia producers one recurrent problem with some drives is thermal recalibration, a procedure

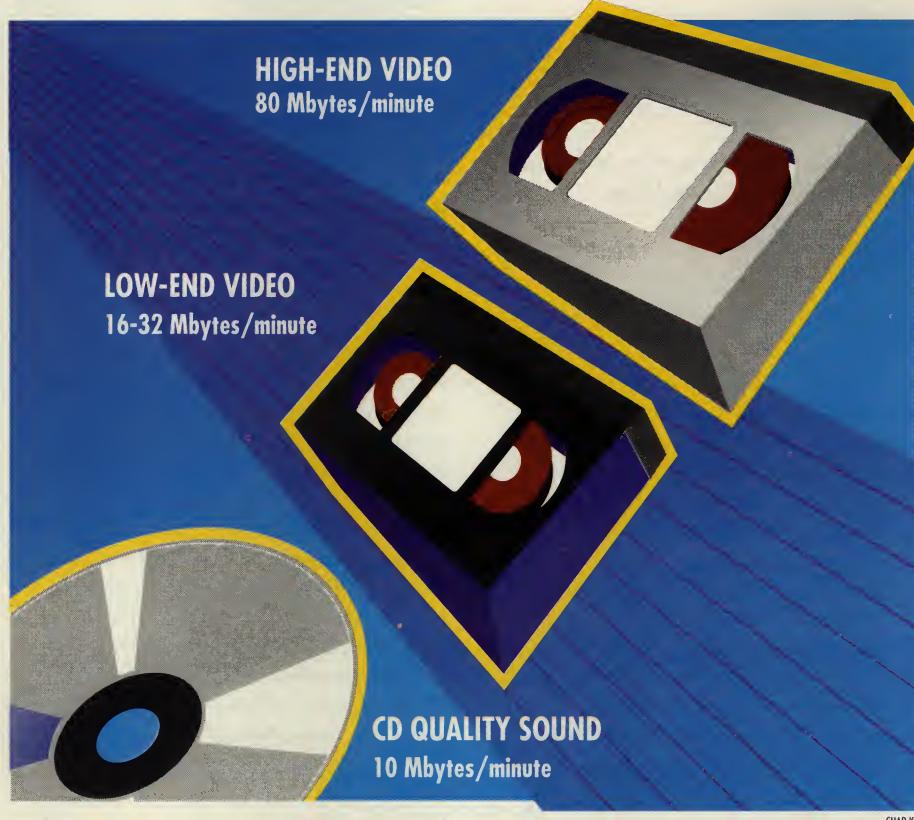
that attempts to compensate for swelling and shrinkage caused by the heating and cooling of drive media. Some older drives perform calibration checks every two minutes, effectively stopping data from being read.

These momentary halts are no big deal if you're scrolling through a spreadsheet, but if

you're watching a movie or playing music, it could result in missed frames, jerky action or unwanted interruptions.

"When you're playing back video, there's a problem if it happens in the middle of a video stream, but most of the cards and software

See Drives, next page



The amount of storage needed depends on the production system in use and the level of quality desired.

How big can your hard drive grow?

Today, "high-capacity magnetic hard drive" indicates the ability to store 2 to 3 Gbytes on a single platter. While 5.25-inch drives can handle the most data, 3.5-inch drives are catching up quickly. Given the usual technological breakthroughs, how much more data will these drives store in the future? Experts agree that the answer is "much, much more."

"Theoretically, the drive makers could make 10-Gbyte or even 20-Gbyte drives, but I don't think they'll do that," said James Porter, president of Disk/Trend Inc., a market research company. Porter said the 3.5-inch drive is rapidly becoming a standard, which will limit capacity somewhat. "You're going to see that the 5.25-inch drives won't go much beyond 3.5 Gbytes in capacity, although some may go up to 5.5 Gbytes," Porter said. "I expect to see the 3.5 drives go up to 3 Gbytes in another year."

Holly Sachs, director of product management for Micropolis Corp. of Chatsworth, Calif., agreed. "There are various technologies being worked on by all the disk drive companies for putting more information on a single drive," she said. "On a 5.25-inch form factor the current limit is just over 3 Gbytes, [but] you can anticipate that you'll soon hear announcements to go beyond that."

According to Kevin Perry, director of product development and marketing at Microtech International Inc., other technologies are helping to boost capacity. One is zone bit recording, a formatting technique — already used in some hard disks and magneto-optical drives — that puts more sectors on a disk's longer outer tracks. Manufacturers may also start to build high-speed data-compression chips into drive controllers, as tape drive makers have been doing for several years. In April, Seagate Technology Inc. announced plans to adopt MemCor, a proprietary glass-ceramic material developed by Corning Inc. of Corning, N.Y., as the substrate in future disks. MemCor is stronger, more durable and more consistent than the aluminum now used in most drives, making it possible for the recording head to fly closer to the magnetic media, thereby increasing density and capacity.

Sony Corp. recently announced a technology it calls PERM, or Pre-Embossed Rigid Magnetic, which it said will enable the development of 2.5-inch disks with a capacity of 1.5 Gbytes "within the foreseeable future." Derived from techniques to master CDs, PERM uses grooves in the disk surface between data tracks; servo data in the grooves provides more accurate head positioning, which allows higher capacities.

"I would hesitate to say in this fast-moving market that there is a size limitation," Perry said. "Hitachi [America Ltd.] already has a drive for the PC that holds over 4 Gbytes, for instance."

Disk/Trend's Porter said large single-drive size may be less critical in the face of increasingly common drive arrays, however. "For those that need 5 or 10 Gbytes, such as for imaging or a server, the array will be replacing [single high-capacity units]," he said. Arrays add the advantage of almost endless expandability — in fact, arrays that count capacity in the terabytes are already available for IBM PCs and compatibles. — By Mitzi Waltz

Magneto-optical storage: Going 1 Gbyte and beyond

By Connie Guglielmo

Recent innovations in magnetic-optical technology have made it possible for you to hold more than a gigabyte of data — 1.3 Gbytes to be precise — in the palm of your hand.

In the past few months, market leaders Sony Corp., Hewlett-Packard Co. and Max-Optix Corp. announced new 5.25-inch magnetic-optical drives for the Mac that can read and write to a new internationally endorsed 1.3-Gbyte (that's 1,300 Mbytes) storage format — a format that doubles the capacity of the current 650-Mbyte standard on a single cartridge. (IBM Corp. also announced a new drive, but it's not Mac-compatible).

The new capacity lowers the cost per megabyte of storage and with it will come other innovations that reduce seek and access times. It has also had a market impact, slightly reducing the cost of 5.25-inch MO drives. According to experts, these advances will address two of users' biggest complaints about MO technology.

And these price and performance improvements may not only make an already appealing storage option more desirable than other removable-media storage options (such as SyQuest or Bernoulli cartridges) but also help turn what has been considered a luxury item into a desktop commodity.

The MO on MO. Introduced five years ago, MO technology has a lot going for it. For starters, it is a removable media, allowing you to take your data with you or lock it up. MO disks are available in 5.25- and 3.5-inch sizes. (The current standards-approved capacity of 3.5-inch media is 128 Mbytes.)

MO is a rewriteable technology. Unlike CD-ROM and WORM (write-once-read-many) media, you can write over the disks millions of times with no loss of data or disk integrity; the system uses a combination of laser-generated light and electromagnets to read and write data. MO disks are extremely durable, with a minimum 10-year life expectancy.

The technology's appeal has also had to do with its large storage capacity; with an MO drive, you have access to an unlimited amount of storage. The fact that the 650-Mbyte format was based on an American National Standards Institute/International Standards Organization standard also ensured that disks were interchangeable among different MO drives.

The write way. What's changed with the new 1.3-Gbyte format is the way data is written to the disk. With the 650-Mbyte format, the disk was divided like a pie into

See Magneto-optical, next page

Checklist for buying large-capacity drives

- **Size:** Ranges from 1 Gbyte up to 3.4 Gbytes. Drives over 2 Gbytes will require partitioning into two or more volumes.
- **Form factor:** 3.5 inches for internal drives in most Macs, 3.5 or 5.25-inches for externals or Quadra 950.
- **Data transfer rate:** Compare on basis of sustained throughput, not burst.
- **Platter rotation:** Drives with speeds of minimum of 5,400 rpm or higher offer maximum throughput.
- **SCSI 2?** You will need an accelerated SCSI card — or a future Mac — to take full advantage of the enhanced spec.
- **Compare:** Warranty, support and footprint.

Drives

From previous page

are structured to buffer the data enough," said Digital Video's Eye. "On some of the newer drives, that calibration is eliminated already because of the head structure, [and] most manufacturers are at least thinking about eliminating recalibration during the read process."

According to Eye, video users who experience missed frames may actually be seeing transfer problems. "It could be that the drive can't pass through the amount of data necessary to keep a continuous stream going." Other possible causes may include using a Mac with too little processing power and SCSI throughput or relying on hard drives with low platter-rotation speeds.

Although SCSI-2, a standard that theoretically offers much faster data transfer, is often touted in high-capacity hard drive ads, Eye said it offers few advantages to most Mac users because no current Mac models and only a few third-party SCSI cards support SCSI-2's Fast and Wide options.

The market for high-capacity storage has been driven by engineering workstation users and the proliferation of IBM PC-compatible file servers. This means that features of interest to video, audio and multimedia users have sometimes been overlooked in the attempt to meet the storage needs of this much larger market. But manufacturers are beginning to address the requests of these users, and if Apple can change its system software to meet them halfway, the prospects seem bright for more easily integrating 2-Gbyte and larger drives with Macintosh systems. □

The Mac
OS cannot
recognize
any storage
device with
a capacity
that exceeds
2 Gbytes.

Magneto-optical

From previous page

wedges, with each wedge wider at the outside and smaller as you moved toward the center.

The same amount of data was recorded per sector, whether that sector was located at the wider outer diameter or at the smaller inner diameter; the result was that sectors at the outer diameter contained as much data as the inner diameter, despite the fact that there was physically more disk real estate at the outer diameter.

With the 1.3-Gbyte format, the disk is divided into bands or zones just like on vinyl audio records. Through a recording process called zoned constant angular velocity (ZCAV) recording, each zone contains progressively more data (more sectors) as you move toward the outer diameter. That is, more data is being recorded on the wider outer bands than on the smaller inner bands. That change in recording, coupled with a tightening of track pitch and placing data bits closer together, made it possible to double the disk capacity.

Not a first. The 1.3-Gbyte ZCAV format was submitted as a standards proposal by Sony, HP, IBM and 3M Corp. in March 1992 to ANSI, the U.S. representative to the ISO. But it was not the first ZCAV proposal to be endorsed by a standards organization.

That distinction belongs to Maxoptix, a San Jose, Calif.-based MO drive maker. In 1989, Maxoptix introduced MO drives based on a 1-Gbyte ZCAV technology it developed. With the support of companies such as HP, Philips Consumer Electronics Co. and DuPont Optical, among others, the ZCAV media format was endorsed by the European Computer Manufacturers Association, the European counterpart of ANSI.

Maxoptix has offered the 1-Gbyte technology in its Tahiti line of drives, which are sold for the Mac as part of MO storage systems offered by Maxoptix OEMs and value-added resellers, including Iomega Corp., PLI and FWB Inc., said Bob Root, Maxoptix vice president of sales and marketing. "Anything that's 1 Gbyte out there is ours," Root said. According to Maxoptix, more than 30,000 1-Gbyte drives and 200,000 1-Gbyte disks have been sold since 1990.

In 1990-91, Sony submitted its counterproposal for a ZCAV storage format with a 1.3-Gbyte capacity. That capacity received endorsement from manufacturers such as IBM, MO media maker 3M and eventually

HP, as well as ANSI and ECMA, according to Akyra Pagoulatos, Sony marketing manager for rewritable MO, also in San Jose.

"What becomes a standard has to do with feasibility, whether the key components can be commercially available to others and whether it can be supported with products in a reasonable time frame," Pagoulatos said. "But if anything, it's politics."

With the groundswell of industry support and ANSI endorsement behind the 1.3-Gbyte capacity, Sony, HP and Maxoptix began designing new drives.

The drives. Sony's SMO-F521, HP's Model C1716T and Maxoptix's T3-1300 drives have several things in common.

They are backward-compatible, which means they will read and write both 1.3-Gbyte media and existing 650-Mbyte disks. In addition, Maxoptix will continue to support the company's 1-Gbyte capacity. Its T3-1300 will read and write 1-Gbyte-capacity media in addition to 1.3-Gbyte and 650-Mbyte disks, said Werner Glinka, Maxoptix director of marketing.

All three drives are jukebox-ready — that is, they can easily be incorporated into jukebox systems, which are gaining in popularity for archiving, or off-line storage.

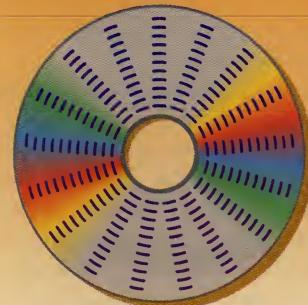
There are, of course, differences. Like most 5.25-inch MO drives, the Maxoptix and HP units will be full-height drives. Sony is offering a half-height mechanism.

Seek and access times also differ. MO drives actually require at least two passes to write data: one to erase old data in the areas to be written, the other to write new information. A third pass is added for verification, although some drive makers let you turn off the verification pass to improve performance. It's these bottlenecks that make MO drives so much slower than magnetic drives, such as SyQuest, and that have kept MO an off-line and near-line storage technology.

To help cut access times, all three drives incorporate split-optics heads, a technology that Glinka said Maxoptix was the first to use in its MO drives in 1989. Split-optics was devised as a way to reduce the mass — weight and size — of the optical pickup or head that moves across the disk; the smaller head translates into faster seek and access times.

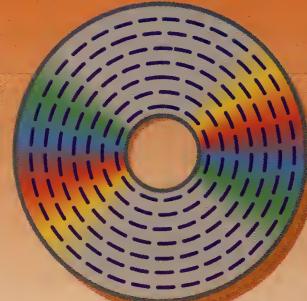
For 1.3-Gbyte media, the Sony drive offers an access time of 40 milliseconds and a maximum sustained transfer rate of 2 Mbytes per second. HP promises an average access time of 36 milliseconds and a data transfer rate as fast as 1.6 Mbytes per second for reads and

Going to 2x capacity



5.25-inch MO disk
650-Mbyte format
(1x capacity)

Magneto-optical disks, like floppies and hard disks, store data in sectors spread along concentric tracks, or zones. In traditional formats, each track has the same number of sectors, so the extra space available on the longer tracks close to the disk's outer circumference goes to waste.



5.25-inch MO disk
1.3-Gbyte format
Zoned constant angular velocity (ZCAV) recording
(2x capacity)

With a formatting technique called zone-bit recording, or zoned constant angular velocity (ZCAV) recording, the number of sectors varies with the length of the track: The extra space on the longer outer tracks is used for additional sectors and thus more data. The adoption of ZCAV is the main factor accounting for the doubling of capacity — from 650 Mbytes to 1.3 Gbytes — in the new generation of 5.25-inch MO disks.

half that on writes. Maxoptix claims an average access time of 25.25 milliseconds and data transfer rates of 2.2 Mbytes per second for reads and half that on writes.

"Our goal is to get as close to hard disk speeds as possible [which average 10 to 20 milliseconds],” said Glinka, who predicts MO drives will soon be used for on-line storage. “We want to put our drive on every desktop or in every home — wherever you have a computer now with a hard drive.”

HP and Maxoptix plan to ship their drives in volume in early summer. And while the drives are still expensive (several thousand dollars compared with about \$500 for CD-ROM and low-end magnetic tape drives), prices are falling. HP's Model C1716T will list for \$3,950; the company also cut the price of its 650-Mbyte optical drive to \$3,150. Maxoptix, which sells its drives only through OEMs and VARs, expects the drives to have a list price of \$3,495.

Sony plans to ship its drive in volume in the third quarter; pricing has not been set, but the company said it will be competitive with its 5.25-inch MO drive, which retails for \$3,995.

Media. Another factor that will help MO gain desktop acceptance is the economies of scale it provides, namely the cost per megabyte. Both Sony and HP will be marketing new 1.3-Gbyte MO media. Sony's disks will retail for \$280; HP's media will retail for \$189 per disk.

The improved capacity helps drop the cost per megabyte when compared with 650-Mbyte disks. The new 1.3-Gbyte disk represents a drop in price per megabyte from 31 cents to 22 cents for the Sony media and from 24 cents to 14 cents for the HP media.

Charlotte, N.C.-based Verbatim Corp., the second largest supplier of optical media in the United States after Sony, has also started shipping 1.3-Gbyte disks and has announced plans to produce 1-Gbyte disks to support the Maxoptix drives. Although OEMs are usually slow to adopt new technologies, John Stevens, manager of business development for Verbatim, said the shift from the 650-Mbyte to 1.3-Gbyte format has been fairly painless.

"The recording technology didn't change in a significant way in going from the pie shape to the zoned recording with 1.3 Gbytes," Stevens said. "We're working toward the next-generation products. In order to take the technology further, you're going to have to increase data density further, tighten the track pitch and create more zones. And that's going to mean a change in the method of recording."

The future. In only a relatively short time — about two years — new 5.25-inch MO capacities are expected to reach the market (the next standards leap for 3.5-inch media will be 230 to 256 Mbytes). Sony, HP, IBM, Maxoptix and others have already submitted proposals for 5.25-inch MO disks with 3X and 4X capacities — or 2 to 2.6 Gbytes. Expect another political as well as technical battle to see which format wins out.

"Should we go to 3X or 4X capacity? That's an interesting transition," said Art Rancis, vice president of OEM and systems reseller channels marketing for Sony in Park Ridge, N.J. "We're going to have to balance the needs of the marketplace against the available laser technology. It's hard to tell yet where the two will meet." □



CHAD KUBO

MiniDisc and DCC: Will they be playing more than music?

By Eric J. Adams

Although popular as storage and distribution media in the computer industry, both CD-ROM and digital audio tape technologies trace their origins to the consumer-electronics industry, where they began as audio-distribution formats.

Two new audio formats — the MiniDisc from Sony Corp. of America of Park Ridge, N.J., and the Digital Compact Cassette, or DCC, from Philips Consumer Electronics Co. of Knoxville, Tenn. — are possible inductees into the world of computer-based data storage. Although no computer products have been announced, both formats offer a lot of potential.

The shrunken CD-ROM. If you think a CD-ROM is small, wait until you see the MiniDisc. With a 2.5-inch diameter, the MiniDisc, or MD, is less than half the size of the traditional CD, yet it can hold 74 minutes of recorded music or 130 Mbytes of computer data.

But don't try to store data on one of these tiny disks — not yet. MD was only recently released as a consumer audio format, and an MD data-storage device is still one to two years away, according to Manny Vara, director of corporate communications for Sony Computer Peripherals. Whether users will want to wait out the technology, however, remains to be seen.

"Its size will make it an excellent portable storage device," Vara said. "And, of course, it is digital, so you enjoy the benefits of all digital recording technology: instant access and nonsequential recording capability."

Best of all, the MiniDisc is rewriteable, so it offers all the data stability of CD-ROM while overcoming the most obvious drawback of today's drives.

MDs are also more rugged than traditional CD-ROMs, according to Vara. The disc is encased in a cartridge (and looks strikingly like a floppy disk), so it's not susceptible to dust, fingerprints or leaking coffee cups.

The drives that write and read MDs will

obviously be smaller, too. "The few audio MiniDisc players that have hit the market so far are giant compared with what the product will be," said Paul Foschino, MD marketing manager at Sony. The obvious application is for notebook computers, where an MD drive will take up no more room than a floppy drive and will offer more storage capacity than most notebook hard drives today.

But if Sony has its way, MiniDiscs may compete in offices as well. "Sanyo is already showing a three-MiniDisc changer for audio MDs," Foschino said. Jukeboxes for data MDs can't be too far off, with Foschino predicting that tiny MiniDisc desktop jukeboxes will one day store thousands of megabytes of removable data while occupying precious little desk real estate.

"We're in the process of writing [data] standards for the MiniDisc now," Foschino said. "Meanwhile, we're marketing it solely as a consumer device."

DCC a long shot. One of the greatest selling points of the other audio format reaching market, Philips' DCC, is that its players are designed to play analog cassettes, as well as record on and play new digital cassettes that offer CD recording and playback quality. Digital cassettes are more ruggedly designed than their analog counterparts, complete with metal sliders protecting the tape when it's not in use.

So far, there is no indication that DCC will follow the precedent of past audio formats and make its way into the data-storage market. "We have absolutely no plans to market DCC as anything but a consumer device," said Jon Kasle, director of public relations for Philips. Philips even declined to provide technical specifications for the DCC format for this story.

But never say never. Philips invented the 5-inch CD format more than 10 years ago, a format that begat CD-ROM, Compact Disc-Interactive and Photo CD. To date, DCC is the only competitor mentioned to Sony's MiniDisc. Can DCC backup devices be far behind? □

If you think a

CD-ROM

is small, wait

until you see

the MiniDisc.

Souped-up PowerBooks offer maximum memory on the road

By Larry Stevens

For many owners of the first PowerBooks, the largest available drive was 40 Mbytes. But don't worry. Larger capacity drives will let you bring more files on the road.

PowerBooks have never been known for roomy hard drives. The initial Mac PowerBook 100, 140 and 170 offered modest storage space by the standards of most users today. The highest capacity you could get was 40 Mbytes. Even now, the base configurations of the PowerBook 145 and 160 have 40-Mbyte drives. Chances are, if you bought anything less than an 80-Mbyte drive and have used your PowerBook for a year or so, you're hurting for space.

Luckily, you don't have to continue to work with the same drive you bought with your PowerBook. Drives with capacities of up to 200 Mbytes that can slip into your notebook are now available from a slew of storage vendors, including FWB Inc., Microtech International Inc., La Cie Ltd. and APS Technologies.

The main advantage of a larger drive, is, of course, that it allows you to keep more files on hand. "It makes my PowerBook more like a portable office," said Dennis Brothers, director of engineering at Cypress Research Corp. of Sunnyvale, Calif. Brothers recently upgraded the 20-Mbyte drive in his PowerBook 100 to a 213-Mbyte Toshiba drive from APS. The increased capacity has meant he leaves fewer files behind on his hard disks at home and in the office. "It's more likely that the file I need is with me," he said.

The cost factor. The only disadvantage of installing a new PowerBook drive is cost. PowerBooks use 2.5-inch drives, which are more expensive per megabyte than 3.5-inch or 5.25-inch drives. For example, APS Technologies' internal 160-Mbyte PowerBook Go•Drive is \$499, whereas the APS external 170-Mbyte ELS low-profile drive is \$329.

There are no other downsides to upgrading your internal drive. Previous user concerns that they required more power than lower-capacity drives proved to be unfounded.

Install it yourself? If you buy the drive from your local Apple dealer, the technician will install it for a price ranging from free-with-the-purchase to about \$30. If you buy the drive secondhand or from a mail-order dealer, you'll have to decide whether to install it yourself or pay an Apple-authorized service center to do the job.

If the PowerBook is still under warranty and you don't want to lose it, no one except an Apple service center can open the case. So users of the 145, 160, 165c, 180 and Duos, all of which are still under warranty, should think carefully before they install their drives themselves. Of course, it's often after that one-year warranty period that the accumulation of files becomes a problem.

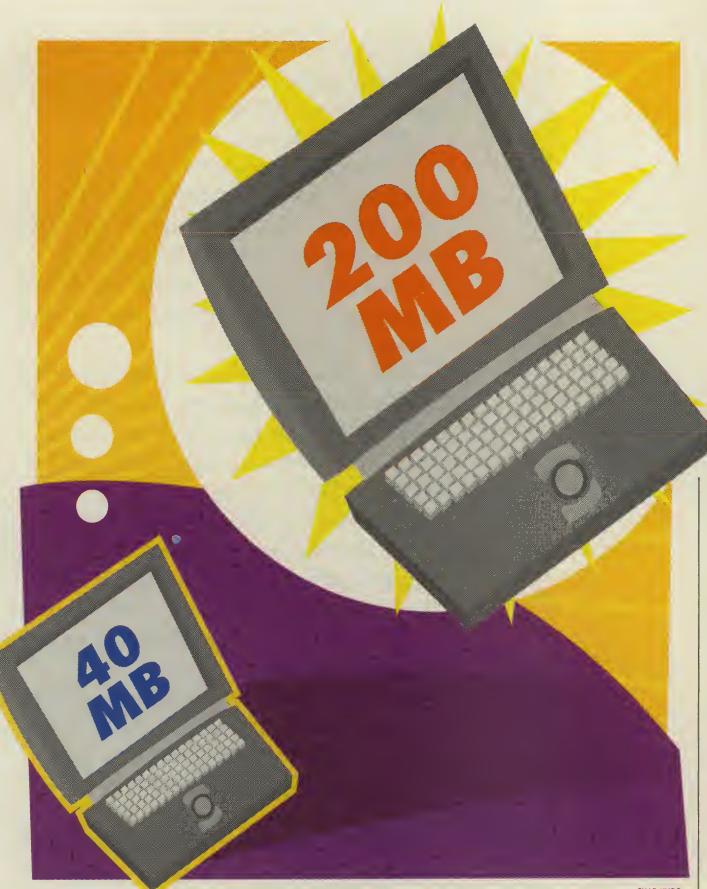
If your PowerBook is out of warranty, the advice from experts is that changing the drive yourself is relatively easy but potentially dangerous.

"Unless you have 10 thumbs, you can exchange the drive yourself," said Brothers, who exchanged his in 15 minutes. But, he said, "If you're not grounded and you touch the wrong thing, you can blow out your PowerBook."

All drive makers' literature backs up Brothers' point. It provides specific instructions for do-it-yourselfers but warns that any time a PowerBook's case is open, there's a chance of damage. Said a spokeswoman from Quantum Corp. of Milpitas, Calif.: "Two-and-a-half-inch drives are very delicate and so is the PowerBook. We don't recommend user installation."

The hardest part of installing an internal drive in the PowerBook is opening the case. Doing so to the PowerBook 100 is easy;

See PowerBooks, Page 44



CHAD KUBO

Putting drives together for big storage impact

By Mitzi Waltz

Companies looking for ways to increase the speed of on-line storage now have an array of choices — disk arrays, that is.

Besides providing large storage capacities, disk arrays — hard drives strung together to form a single logical device — promise to dramatically increase speed. When coupled with RAID (redundant array of inexpensive disks) technology, arrays also promise to increase uptime (see story, Page 42).

The prices for arrays start at about \$2,900 and go as high as \$40,000. These big tickets are barriers for some buyers, but vendors downplay the cost. "It isn't that much more for a disk array"

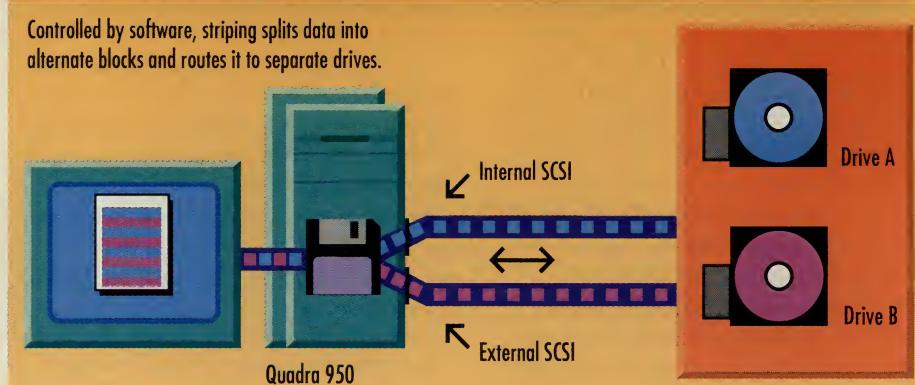
than for a comparably sized individual drive, said Tad Shelby, PLI marketing manager.

"When you're dealing with individual drives that give you this kind of throughput, they are typically ZBR (zone bit recording) drives that vary in throughput," Shelby said. "When you're reading data from the outside of the disk, you'll get very high throughput, but as you get toward the inner tracks, it will be lower. For applications that need high-volume sustained throughput — QuickTime, loading Photoshop images, pulling 8- to 10-Mbyte images off an image database — [arrays are] worthwhile."

PLI markets its external MiniArray line in *See Arrays, Page 42*

How Quadra 950 handles a Level 0 disk array

Controlled by software, striping splits data into alternate blocks and routes it to separate drives.



The existence of two ports makes development of disk arrays for the Quadra 950 much easier. Disk arrays for non-Quadra computers must be supported by high-performance SCSI host adapters.

NEVIN BERGER

The new 3.5" removable

Infinity 105 Turbo S removable cartridge drive

The Infinity Turbo 105 S sets a new standard in Winchester, removable storage. It is the smallest, yet fastest removable drive around, allowing you unlimited storage capabilities by simply adding additional 105MB cartridges.

Here's why the Infinity 105 is the ideal storage device for animators, on-line editors, and interactive multi-media markets:

Small size

Similar dimensions of a paperback novel

High Capacity

Stores 105MB on 3.5" cartridges

Speed

Sustained data transfer rates up to 1.75MB/sec and fast 14.5 ms access time

Versatility

Able to use with all SCSI-capable Macs

Capable of playing MPEG and QuickTime movies at high frame rates

In short, the Infinity Turbo 105 S offers a realistic storage solution for storing multi-media, desktop publishing and database files. And for dependability you can trust, the Infinity Turbo 105 S utilizes time-proven Winchester technology - the same reliable technology used by your fixed hard drives.



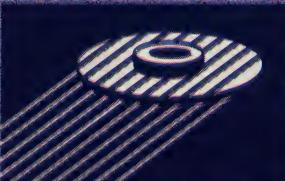
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PLI

Arrays

From Page 40

sizes from 480 Mbytes to 2 Gbytes. It also has two-drive internal arrays for the Quadra 950.

Divvying up the data. Arrays take many forms, but the essence of the technology is putting two or more drive mechanisms to work in parallel. A stream of data to be written is divided among the mechanisms; data being read from multiple drives has to be recombined before it can be used.

On Macs with dual SCSI channels and high throughput, such as the Quadra 900 and 950, drives can be connected to each SCSI port, with software alone turning them into an array. With most Mac models, however, arrays require a SCSI adapter card, both to create a second SCSI channel and to provide enough throughput to keep pace with today's fast drives.

MicroNet Technology Inc., for example, now sells its Raven systems, one of the original array offerings for the Mac, primarily to Quadra users, but for users of other NuBus Macs the company continues to offer Raven arrays bundled with its NuPORT SCSI card. PLI, likewise, bases its external arrays on its QuickSCSI card.

Cards also let vendors offer arrays with Fast and Wide SCSI, high-performance SCSI-2 options that even the Quadras don't yet support. Storage Dimensions Inc., for example, uses various versions of its DataCannon processor direct slot cards to support its MacinStor SpeedArrays, which support Fast SCSI, and its MacinStor Wide subsystems, which transfer data 16 bits at a time instead of the eight bits normally used in SCSI.

Server-ready storage. Drive arrays may be ideal companions to Apple's new servers, according to several observers.

"I'm attempting to entice some of my clients who are always complaining about lack of speed on their servers to try out arrays," said Dave Whitby, whose Los Angeles network consulting company, Command Options, specializes in implementing multi-user database setups. "I've seen a major advantage in throughput of large files, especially on Apple's new machines."

Whitby has been using PLI's MiniArray with a Centris 610 and getting throughput of 4 Mbytes per second on reads and 3.6 Mbytes per second on writes, he said. "Setup was

RAID in a nutshell

RAID (redundant array of inexpensive disks) is a platform-independent concept that covers six arrangements of cooperating disk drives. Five of these are relevant to Mac users.

- **Level 0:** Stripes data across several disks, reducing access times and increasing throughput.
- **Level 1:** Allows users to configure one drive to act as a real-time backup of another drive, a process known as disk mirroring. It can be expensive because it requires you to buy double your needed capacity, but it provides a high level of data security. No performance benefit.
- **Level 2:** Not used on the Mac.
- **Level 3:** Combines two or more striped drives with one drive configured to hold parity data, which is used to reconstruct files in case a striped drive fails. Since data is spread across more than one drive, transfer rates are higher.

Disk arrays speed up video production for professional movie maker

There may be several reasons to use disk arrays: fault tolerance and data integrity to name two. But for Frank Dutro, there's one reason and one reason only: speed.

"When you're working with video applications and full-motion video all day," said Dutro, a motion-picture consultant at Paramount Pictures, "it's got to be fast. Disk arrays give us the high transfer rates we need."

Dutro spends most of his day doing previsualizations, nonlinear editing and other video-production work on his Mac Quadra 950. Along with a 230-Mbyte start-up drive, his Mac is equipped with a 2-Gbyte MiniArray 040 from PLI designed specifically for the Quadra 950.

"The drive is actually two drives in one. It fools the Mac into thinking it's one volume, so it writes and reads nearly twice as fast," Dutro said.

That's the basic nontechnical explanation of the concept behind the MiniArray and all disk arrays, according to Keven Fazio, PLI product manager. The device is actually two 1-Gbyte drives that work simultaneously through two SCSI ports. Since data is read and written to both drives, the transfer rate doubles and seek times can be cut in half, compared with a single drive of comparable size, Fazio said.

How much faster is the array? Dutro said he regularly sees sustained transfer rates of 7 Mbytes per second, enough to run full-motion video at a resolution of 320 by 240 pixels. "Even with full-screen and full-motion video, it does the job without even breaking a sweat," Dutro said.

According to PLI, the two-drive design improves performance by some 95 percent over comparable single-drive systems. The remaining 5 percent is the overhead required by the



BOB RIHA

Frank Dutro, a consultant, uses a PLI MiniArray: "Even with full-screen, full-motion video, it does the job without even breaking a sweat."

software to "stripe and span" the data across the two drives.

"Striping is the process of sending alternate blocks of data to alternate drives, and spanning lets your Mac recognize two drives as a single volume," said Tad Shelby, PLI marketing manager.

Dutro chose the internal model MiniArray drive because it doesn't require separate NuBus cards. "Plus, when I take my Quadra from studio to studio, I don't have to haul another drive."

Unlike more-sophisticated disk array systems, the \$5,231 MiniArray doesn't offer extra fault tolerance or data integrity features. But for Dutro, who works with Macs and movies all day, the increased speed is good enough to justify the cost. — By Eric J. Adams

completely intuitive," he said. "For all intents and purposes, it's just another hard drive."

Old players and new. The emerging array market has attracted the attention of a growing list of well-known Mac storage vendors. In addition to MicroNet, PLI and Storage Dimensions, FWB Inc. offers a line of arrays called SledgeHammer. And Mass Microsystems Inc. in December rolled out two array lines: two-drive PersonalArrays and five-drive MASSterArrays. The latter, at prices starting at more than \$20,000, offer a fault-tolerance feature called "hot swapping," or the option of replacing failed drive mechanisms and power supplies without shutting down the entire unit

— a capability especially attractive for use in server and transaction-processing settings.

Along with the big names in Mac storage, several younger and smaller companies are using array technology to make a name for themselves. The array Apple chose to demonstrate at the rollout of its Workgroup Server series, for example, was a hot-swapping unit from start-up Conley Corp.

Among other players appearing on the array scene, Mega Drive Systems Inc. offers a RAID 5 system that can hold up to 10 Gbytes. Loviél Computer Corp. is planning several arrays based on software from Trillium Research Inc. And Transoft Corp., an established Mac software developer now moving into the hardware market, is working with AT&T Co.'s NCR subsidiary to bring NCR hot-swapping arrays to the Mac market under the DataDock name.

In addition, vendors offering arrays on other platforms have begun to eye the Mac market. Pacific Micro Data Inc., for example, recently added support for the Mac to the MAST VII, its RAID 5 disk array, which also works with Novell Inc.'s NetWare 3.11, Microsoft Corp.'s upcoming Windows NT, SCO Unix and other operating systems.

Multimedia array. High throughput and reliability are of special interest to multimedia and digital video users. ImMIX has responded with the VideoCube, a 3.7-Gbyte drive array that uses proprietary compression technology to store one hour of video or two hours of CD-quality audio.

Do-it-yourself array. While all arrays are modular devices to some extent, users

See *Arrays*, Page 44

Drive arrays
may be ideal
companions
to Apple's
new servers,
according to
several
observers.



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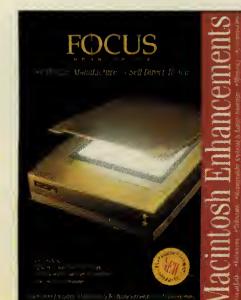


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Arrays

From Page 42

have generally not had much choice about whose or what kind of drives they can use.

This month, Trillium will release Remus, a Mac application that aims to offer users more array choices. With the \$795 Remus software (\$695 through Aug. 31), users will be able to configure multiple hard drives, SCSI cards and other SCSI storage devices, including tape drives, opticals and removables, as RAID systems. Remus will support RAID levels 0, 1, 4 and 5, offering unlimited drive partitioning plus built-in network monitoring and notification features.

"Remus is phenomenal," said Michael Walton, vice president of operations at Seraph Inc. of Minnetonka, Minn., who is beta testing a Remus array. "I've run the array off a IIfx, a Centris 650 and a Quadra 950, setting up many different partitions using different RAID levels."

Trillium President Dennis Bisogno said: "What Remus will do is allow you to use high-level RAID techniques for much less. If you want array performance, all you need is a SCSI accelerator board — \$4,000 will cover new drives and everything else."

Setup time is also much shorter with Remus, Bisogno said. "It takes seven hours to configure some towers, as opposed to 10 minutes for this."

Software-based arrays such as Remus' may bring down the prices of their hardware-inclusive cousins and give array manufacturers a reason to support user-selected drives.

A few caveats. Array users will need to partition their drives into segments no larger than 2 Gbytes each — the largest volume the Mac operating system can recognize. Partitioning also helps create usable work spaces; some users of large arrays complain that files are easily misplaced once your disk approaches 2 Gbytes.

For transfer-intensive applications, arrays offer high-performance, fault-tolerant alternatives to large-capacity hard drives or other high-volume storage devices. □

PowerBooks

From Page 40

doing so to the Duos is difficult. All the other PowerBooks fall somewhere in between. And unless you have a well-stocked electronics workroom, you may have to buy some equipment to install the drive.

The PowerBook 100 can be opened with flat-head and Phillips screwdrivers. But other PowerBooks require a size 8 and size 10 Torx screwdriver, which you may have a hard time finding at the local hardware store. Most drive makers sell the needed set of tools for about \$20, but if this is likely to be the only time you'll need the tools, you might be better off paying the same \$20 to have the drive professionally installed.

You'll also need a grounded work area and wrist strap. Both are essential to eliminate the danger of a static charge destroying the PowerBook's circuitry.

Retired drives. If your PowerBook's internal drive is too small but is running strong, you're faced with the problem of early obsolescence.

The most promising solution is to install the old drive in a case that allows it to be used as an external drive. Microtech's Roadrunner DataXpress and APS' PowerBook Companion case are two examples. While this option preserves your original investment, the cost of the case ranges from less than \$100 to nearly \$200. This cost has discouraged some users.

Said Paul Marcowitz, who runs a computer consulting business in Amherst, Mass.: "It hardly seems worth it to pay \$200 to put my old 20-Mbyte drive in an external case. I wouldn't pay that kind of money for a used 20-Mbyte drive."

However, since the case price is the same no matter what size drive you place in it, the larger the original drive, the more economic sense it makes to get a replacement case.

External drive. One alternative to upgrading your notebook's internal drive is to opt for an external pocket drive. These



MARY KANE

weigh less than 1 pound, are about the size of a cigarette case and can run on battery power. Besides eliminating the need to exchange drives, they provide the flexibility and security of a storage medium that can be sent to colleagues or locked in a hotel safe. Their small weight and size also mean they take up little space when you travel.

However, pocket drives require a SCSI port, which the Duos lack unless docked, and special SCSI cables.

Shelly Katz, a Dallas-based photographer who does work for Time magazine, uses his PowerBook 180 to work on images captured with his digital camera and stored on a Hitch-Hiker external 80-Mbyte drive from Mass Microsystems Inc.

"I treat the drive like a can of film," Katz said. "I keep it in my hotel room; I send it to editors. It's very convenient."

Small answers. Whether internal or external, solutions to PowerBook owners' storage problems are easily at hand. The capacity of 2.5-inch drives has expanded rapidly during the past two years. And while 200 Mbytes is currently the upper limit, that capacity, along with some careful purging and archiving, should suffice for most users. □

One option after upgrading your PowerBook's hard drive is to install the old drive into an external drive case, such as APS Technologies' PowerBook Companion case. A grounded work area and wrist strap are recommended to avoid possible damage to the circuitry.

Some users of large arrays complain that files are easily misplaced once your disk approaches 2 Gbytes.

2 Gbytes.

Product Info

APS TECHNOLOGIES

PowerBook Companion AC: \$79; **AC/DC:** \$169; **PowerBook drives:** \$279 (80-Mbyte), \$329 (120-Mbyte), \$479 (160-Mbyte), \$569 (213-Mbyte); **PowerBook Go•Drive (internal):** \$499 (160-Mbyte); **ELS low-profile drive (external):** \$329 (170-Mbyte) 2900 S. 291 Highway, Independence, Mo. 64057 Phone (816) 478-8300 or (800) 233-7550; fax (816) 478-4596

CONLEY CORP.

SR1: \$16,995 16 W. 22nd St., New York, N.Y. 10010 Phone (212) 741-9480; fax (212) 741-9296

FWB INC.

hammerPB series: \$599 (80-Mbyte), \$729 (120-Mbyte), \$869 (210-Mbyte); **hammerPB external case:** \$199; **SledgeHammer disk arrays:** \$1,259 to \$12,079 depending on configuration 2040 Polk St., Suite 215, San Francisco, Calif. 94109 Phone (415) 474-8055; fax (415) 775-2125

IMMIX, A CARLTON COMPANY

VideoCube: \$38,500

P.O. Box 2980, Grass Valley, Calif. 95945 Phone (916) 272-9800; fax (916) 272-9801

LA CIE LTD.

PowerBook drives (internal): \$299 (80-Mbyte), \$359 (120-Mbyte), \$499 (160-Mbyte); **PocketDrive (external):** \$299 (40-Mbyte), \$499 (80-Mbyte), \$599 (120-Mbyte), \$729 (160-Mbyte) 8700 S.W. Creekside Place, Beaverton, Ore. 97005 Phone (503) 520-9000 or (800) 999-0143; fax (503) 520-9100

LOVIÉL COMPUTER CORP.

LARC, LARC Internal: prices depend on configuration 5599 W. 78th St., Edina, Minn. 55439 Phone (612) 828-6880 or (800) 688-3696; fax (612) 828-6881

MASS MICROSYSTEMS INC.

HitchHiker Platinum: \$759 (80-Mbyte), \$869 (120-Mbyte), \$1,079 (160-Mbyte); **MASSTerArrays:** \$18,999 to \$39,999 depending on configuration 810 W. Maude Ave., Sunnyvale, Calif. 94086 Phone (408) 522-1200 or (800) 522-7979; fax (408) 733-5499

MEGA DRIVE SYSTEMS INC.

MR/5-5: \$21,856 (5-Gbyte); other configurations available 489 S. Robertson Blvd., Beverly Hills, Calif. 90211 Phone (310) 247-0006 or (800) 322-4744; fax (310) 247-8118

MICRONET TECHNOLOGY INC.

Raven series: prices range from \$2,890 to \$10,990 20 Mason, Irvine, Calif. 92718 Phone (714) 837-6033; fax (714) 837-1164

MICROTECH INTERNATIONAL INC.

Roadrunner DataXpress: \$79 (AC), \$159 (AC/DC); **Roadrunner:** \$359 (80-Mbyte), \$399 (120-Mbyte), \$609 (200-Mbyte) 158 Commerce St., East Haven, Conn. 06512 Phone (203) 468-6223 or (800) 626-4276; fax (203) 468-6466

PACIFIC MICRO DATA INC.

MAST VII: \$13,020 (3-Gbyte) 3002 Dow Ave., Building 140, Tustin, Calif. 92680 Phone (714) 838-8900 or (800) 933-7575; fax (714) 838-9787

PLI

MiniArray: \$2,906 (480-Mbyte), \$3,488 (660-

Mbyte), \$3,681 (850-Mbyte), \$3,875 (1-Gbyte), \$5,619 (2-Gbyte); **MiniArray 040:** \$2,131 (480-Mbyte), \$3,197 (660-Mbyte), \$3,391 (850-Mbyte), \$3,584 (1-Gbyte), \$5,231 (2-Gbyte)

47421 Bayside Parkway, Fremont, Calif. 94538 Phone (510) 657-2211 or (800) 288-8754; fax (510) 683-9713

STORAGE DIMENSIONS INC.

MacinStor SpeedArray Wide: pricing not available; **MacinStor SpeedArray:** \$5,614 (2-Gbyte), \$13,169 (5.6-Gbyte) 1656 McCarthy Blvd., Milpitas, Calif. 95035 Phone (408) 954-0710; fax (408) 944-1200

TRANSOFT CORP.

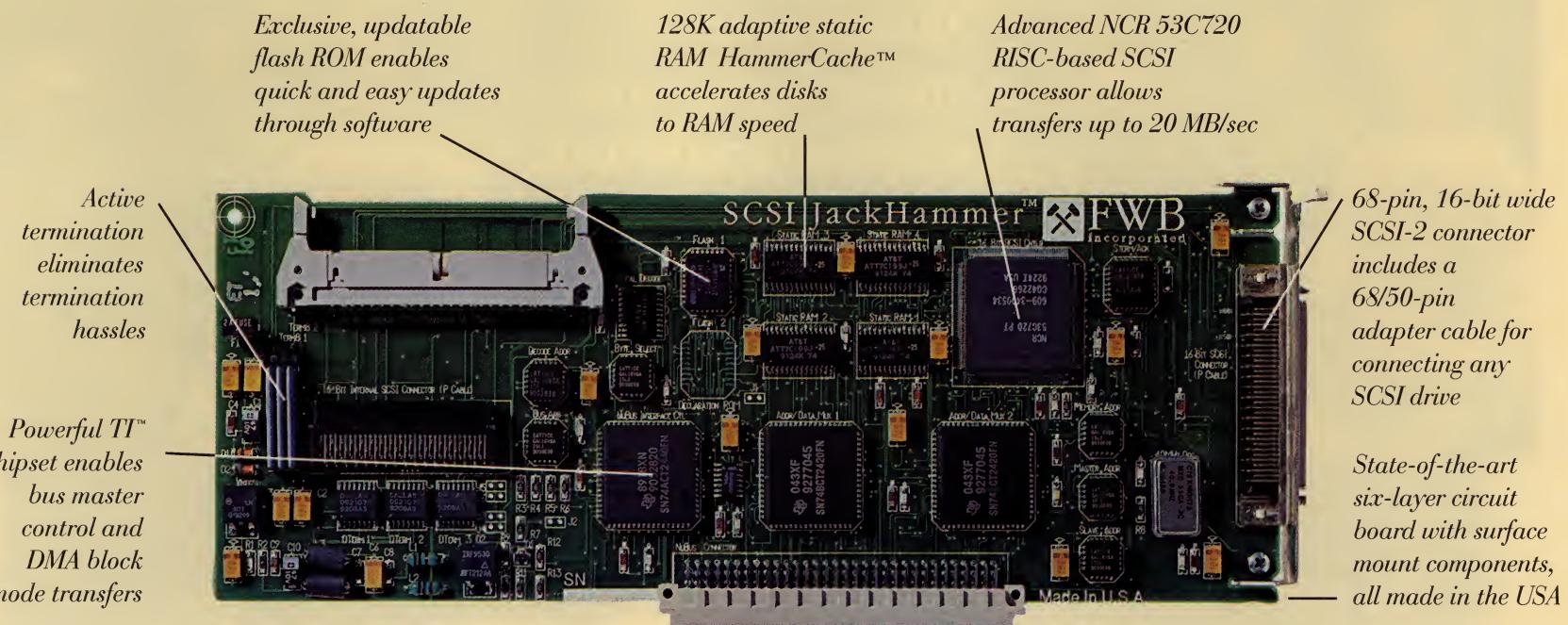
DataDock T-1000: \$4,995; **DataDock T-2000:** \$19,995 31 Parker Way, Santa Barbara, Calif. 93101 Phone (805) 963-7181 or (800) 949-6463; fax (805) 963-7178

TRILLIUM RESEARCH INC.

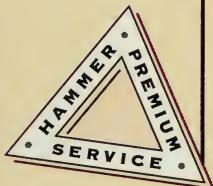
Remus: \$695 (June 1-Aug. 31); \$795 (regularly) P.O. Box 845, Hudson, Wis. 54016 Phone (715) 381-1900; fax (715) 381-1901

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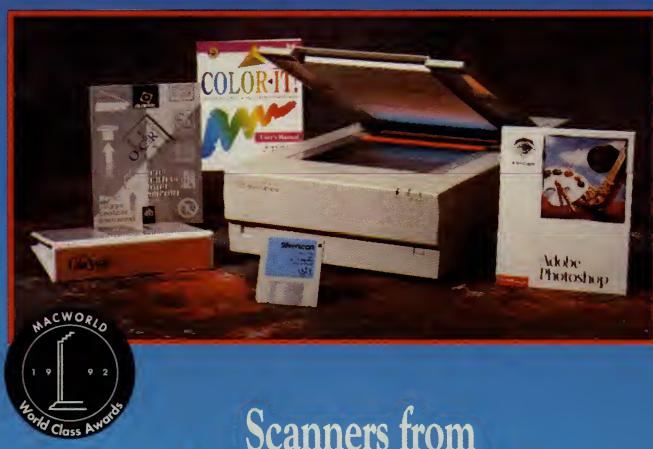
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RasterOps' Editing Aces Suite fulfills its mission in QuickTime

Professional audio capabilities will be an important asset when Sound Manager 3.0 and QuickTime 1.6 arrive.

By Ric Ford

The Editing Aces Suite is a set of products from RasterOps Corp. that digitizes and plays full-screen, full-motion QuickTime movies with high-quality sound. It lists for \$4,697 and competes with SuperMac Technology Inc.'s \$5,999 DigitalFilm (see MacWEEK, Jan. 18).

Perhaps the most important distinction between the products is that the Editing Aces Suite consists of modular components, while DigitalFilm is positioned as an integrated "studio in a box."

At the heart of the Editing Aces Suite is RasterOps' MoviePak, a daughterboard that adds JPEG (Joint Photographic Experts Group) compression hardware to four of RasterOps' video cards — the 24STV, 24MxTV, 24XLTV and MediaTime.

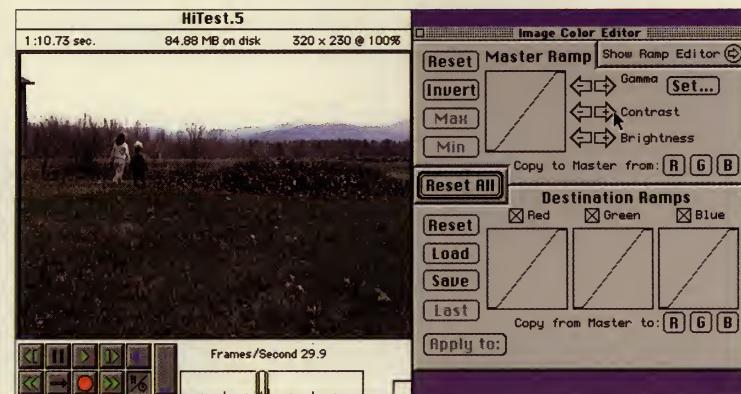
MoviePak uses an LSI Logic chip set to digitize one field per frame of moving video at a maximum resolution of 320 by 240 pixels. MediaTime's 2X hardware zoom produces a full-size image on playback from the quarter-screen movie. (DigitalFilm records one field at 640 by 240 pixels and synthesizes the missing field for playback.)

According to RasterOps, the LSI Logic chips provide an unusually wide range of compression ratios, compared with the

C-Cube Microsystems processor used by others.

Making time. MediaTime is the second Editing Aces component. On a single NuBus card, it combines CD-quality audio processing (from market leader Digidesign Inc.), video processing and circuitry to drive a 13-inch Macintosh monitor at up to 24 bits of color.

A breakout box connects to MediaTime via a short cable, providing S-video and composite inputs for NTSC, PAL (European)



MediaGrabber's movie recording window includes volume, looping and status indicator controls. The color-editor palette offers extensive image-manipulation options.

and SECAM (French) sources and four RCA jacks for line-level audio input and output.

Rounding out the hardware is the Video Expander II, a box that encodes output from the video card into standard TV signals (composite, S-video or component), with genlock capability. The Video

Expander II is available in either an NTSC or PAL version, and MediaTime outputs both.

Like SuperMac, RasterOps includes Adobe Premiere 2.0 in the package. Also included is RasterOps' MediaGrabber, an application for recording images

See RasterOps, next page

Datebook makes jump to Pro league; features improved interface, integration

Update tightens link with Touchbase Pro

By Jeffrey Sullivan

After Hours Software has delivered a one-two punch to the personal information software market, releasing major upgrades to its two flagship products, Datebook and Touchbase. Datebook, After Hours' personal time manager product, has received an overhaul and a new name, Datebook Pro.

Although the changes to the \$79.95 Datebook Pro are not as sweeping as those to its sister product, the contact manager Touchbase Pro (see story, Page 51), they've followed the same spirit, resulting in a program with increased versatility and power that's just as easy to use.

Datebook Pro requires just over 1 Mbyte of disk space and at least 770 Kbytes of RAM. It will run under System 6.0.5 or later, but its linking features, particularly suited to letting it communicate with Touchbase Pro, require System 7 (see story, Page 50).

The previous (non-Pro) version of Datebook will continue to be

sold, through Performa channels only, at a retail price of \$64.95.

New and improved. There is one significant change to the overall framework in which Datebook Pro operates: a new schedule item called a Memo. Memos are used to represent entries — such as shopping lists, daily journals and messages — that can be put on a schedule but aren't characterized as Events or To-Dos (the two other schedule items supported by Date-

book Pro). Like Events and To-Dos, each Memo can contain as many as 32,000 text characters.

To-Dos have been expanded in Datebook Pro. In addition to a three-level priority setting, To-Dos can now be automatically carried forward to the next day if they haven't been completed. Datebook Pro also tracks the number of days a To-Do is overdue, something that Now Software Inc.'s Now Up-to-Date doesn't do.

Datebook Pro features dramati-

See Datebook, Page 50

RATINGS KEY

◆◆◆◆	Excellent
◆◆◆	Very good
◆◆◆	Good
◆◆◆	Fair
◆◆◆	Unsatisfactory

score card

Editing Aces Suite

RasterOps Corp.

Overall value ◆◆◆

List price: \$4,697*

The Editing Aces Suite is a modular, cost-effective package for boosting QuickTime video capabilities to a full-motion, full-screen level. Its professional audio capabilities will be an important asset when QuickTime 1.6 and Sound Manager 3.0 arrive from Apple. RasterOps' MediaGrabber software offers good audio and video controls as well as high-quality captures of still images. The primary limitation of the Editing Aces Suite is its awkwardness in switching between Macintosh and video displays. People on a tight budget might want to combine the suite's MoviePak daughterboard with RasterOps' low-priced 24STV video card, using the lower-quality audio hardware built into newer Macs.

Performance ◆◆◆
Features ◆◆◆◆◆
Configuration ◆◆◆

Compatibility ◆◆◆
Documentation/support ◆◆◆

*MoviePak: \$1,999; MediaTime: \$1,999; Video Expander II: \$699.

score card

score card

Datebook Pro

After Hours Software*

Overall value ◆◆◆◆◆

Version tested: 2.0

List price: \$79.95**

Datebook Pro is the first major upgrade to the personal time management program. The addition of a Memo item to augment Events and To-Dos is welcome, but the more important enhancements to the schedule manager are its improved user interface and greater flexibility. Its integration with After Hours' Touchbase Pro is excellent. Datebook Pro cannot handle group scheduling; it is a personal time manager only — but a very good one.

Performance ◆◆◆◆
Features ◆◆◆

Ease of use ◆◆◆◆
Documentation/support ◆◆◆◆

*Aldus Corp.'s Consumer Division recently signed a letter of intent to acquire After Hours.

**Bundled with Touchbase Pro: \$149.95. Upgrades from previous versions of Datebook: \$24.95; owners of Touchbase and Datebook can upgrade both for \$39.95.

RasterOps

From previous page

and sounds and playing them back out again.

According to RasterOps, other RasterOps video cards can be substituted for MediaTime in a QuickTime editing system with no loss of performance or quality.

For instance, you could trade audio capabilities for lower cost by using a 24STV card in place of MediaTime with the MoviePak daughterboard. In another scenario, you could add a MoviePak to an existing 24XLTV card and install a Digidesign Audiomedia card to gain the capabilities of the Editing Aces Suite with a larger monitor. You could also use a different encoder in place of the Video Expander.

Software. MediaGrabber 2.2 combines strong features from RasterOps' previous software with new audio and QuickTime support.

Like its predecessors, MediaGrabber captures still images

from video at a full 640 by 480 pixels of resolution. Floating palettes offer fine control over image characteristics (such as gamma, contrast and brightness) and determine video setup parameters (hue, saturation, contrast, black level and white level).

The Editing Aces Suite captures QuickTime movies either to disk or to RAM at any size from tiny to full-screen.

The Editing Aces Suite captures QuickTime movies either to disk or to RAM at any size from tiny to full-screen. Standard controls set audio and compression parameters, and the application can dis-

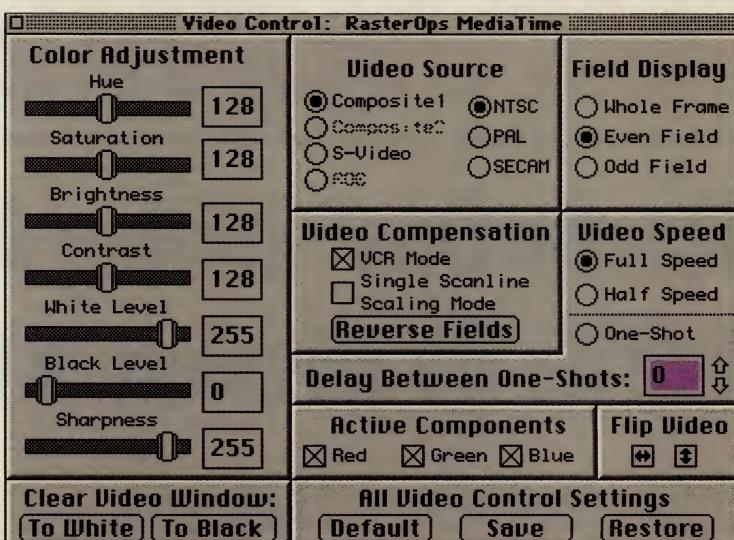
play important information about movie files, such as frame rate, compression quality and the size of individual frames.

MediaTime's Export to Video function, for playing back a QuickTime movie on the Mac or printing it to tape, includes a welcome option that generates standard color bars for calibration.

Along with MediaTime, the Editing Aces Suite includes several system extensions: a VDIG file to register components with QuickTime, a MoviePak extension containing compressors-decompressors (codecs), and an extension containing sound and video drivers.

RasterOps supplies two different codecs: a fast, proprietary MoviePak Video codec and a slower MoviePak JPEG codec that is compatible with Apple's PhotoJPEG codec and more suitable for still images.

Like Premiere and similar applications, MediaGrabber can open and save an existing movie with different compression settings or a different size.



RasterOps provides detailed control over setup parameters and lets you save settings.

The Editing Aces Suite digitizes audio at a 44.1-kHz sampling rate (mono or stereo) and can save tracks in either AIFF (Audio Interchange File Format) or Digidesign's Sound Designer format, in addition to QuickTime format.

As this review was being written, Apple was preparing to release Sound Manager 3.0 and QuickTime 1.6, which promise to enable high-quality output of QuickTime audio tracks through third-party hardware such as MediaTime. So far, QuickTime audio output has been limited to eight-bit samples.

Monitors. RasterOps' MediaTime board, like the company's other video boards, has a single monitor connector. This may be used to drive either a 13-inch Mac monitor or the encoder.

There is no way to connect both a Mac monitor and a video device at the same time, as you can with DigitalFilm. (DigitalFilm switches between Macintosh and TV output signals on the fly.) RasterOps' card can switch output signals, but its single port requires shutting down and reconfiguring cables to switch between a Mac monitor and a video device.

You could use a TV monitor as a Mac display, leaving the Video Expander connected all the time, but this is unpleasant at best. The limitation encourages digitizing all in one phase with a Mac monitor and printing to video in a separate phase using a TV monitor.

Digitizing must take place on the display connected to MediaTime, and you cannot control captures from a monitor connected to a Mac's built-in video port. Live video must be displayed on screen in 24-bit color during captures, which dramatically slows simple Mac operations, such as pulling down a menu.

A final limitation of the MediaTime card is its display speed. It cannot display Mac graphics nearly as fast as DigitalFilm's Thunder circuitry or the built-in video ports of Quadras and Centris, and it does not support monitor sizes other than the 13-inch, 640-by-480-pixel standard.

Performance. The limitations of the Macintosh make it impossible to handle broadcast-quality video in real time, and products at the leading edge of QuickTime technology are struggling just to provide acceptable quality in non-critical video applications.

Image comparison: Editing Aces Suite, DigitalFilm and Photo CD



These four images show the image degradation that accompanies current digital video compression technologies.

In the image taken directly from a Photo CD (upper left), there is no jaggedness in diagonal lines and the texture of cloth is apparent. A much higher-quality version of the image is also stored on the Photo CD, but we chose a television-quality image.

The still image captured from an S-video signal (upper right) by RasterOps' Editing Aces Suite is very good for a video source, but it shows a loss of detail and color bleed inherent in the analog NTSC signal.

Two QuickTime movie images were captured at maximum size and the best compression quality, straining the bandwidth limits of the fully loaded Quadra 950 platform.

Despite this, they have lost detail — only the rug retains texture. Jaggedness appears along diagonal lines. The DigitalFilm image (lower right) appears a little softer and a little smoother than the RasterOps image (lower left), but their resolution is similar.

Images compressed more drastically (at "Normal" quality) show smearing, halos, and further degradation of detail and texture. — By Ric Ford

DigitalFilm develops

Following our review of DigitalFilm (see MacWEEK, Jan. 18), SuperMac Technology Inc. announced a money-back guarantee, engineered and shipped a product update (which we helped beta test), and bundled additional products in the package.

Version 1.1 of DigitalFilm includes a new application, DigitalFilm Player; a plug-in for Adobe Premiere, Print to DigitalFilm; and an updated system extension.

This software eliminates some of the motion stutter of the first version and adds convenient monitor switching for print-to-video operations.

Audio synchronization was also improved, and SuperMac addressed start-up and crashing problems in certain situations. Other tweaks were made to audio and video color and contrast.

Now included in the bundle is After Effects, a QuickTime compositing and special-effects application from The Company of Science & Art, and Diaquest Inc.'s DQ-TimeCoder, a Premiere plug-in and cable that brings SMPTE or EBU timecode into Premiere from professional videotape decks that support RS-422 protocols. — By Ric Ford

Results from the Editing Aces Suite and DigitalFilm are not very far apart, despite their architectural differences.

Both lose frames when capturing full-size images at maximum compression quality, even on a Quadra 950 loaded with RAM and a high-speed disk array. This happens despite the fact that only one field per frame is digitized. The problem becomes much worse on slower disk drives and with slower Macs.

Dropped frames produce very obvious motion problems, depending on the subject of the video. Moving subjects become unnaturally jittery and jerky at higher frame rates and strobelike at lower frame rates.

Reducing compression quality dramatically improves frame rates and smooths out motion, and the eye is less sensitive to degradation of the image from a little extra compression than it is to motion problems.

Because of its resolution limitations when capturing moving video, the Editing Aces Suite exhibits pixelation and loss of detail, plus jagging along diagonal lines, even at high quality settings. Sharpness is good, within its limitations, but smearing and halo effects from JPEG compression become more obvious at lower quality settings (see comparison images, previous page).

DigitalFilm's output appears a little smoother and softer by comparison, but it has the same characteristic problems.

The Editing Aces Suite captures still images from video with much higher quality than it captures movies, and this gives it one advantage over DigitalFilm.

RasterOps' MediaTime board also has a large advantage in audio quality. We noticed a touch of low-level noise in our audio tests, but the overall audio quality was excellent.

lent and certainly suitable for professional video work. Using the audio's full bandwidth can affect QuickTime performance, however.

Compatibility and support.

We did not encounter any serious bugs in testing with a variety of source material and a variety of digitizing configurations, from a Centris 650 with 8 Mbytes of RAM and a standard hard drive to a Quadra 950 with 64 Mbytes of RAM and a fast disk array.

Trying to digitize from the wrong port — choosing the composite input when video is supplied only to the S-video input, for example — caused the system to freeze, but this is not a major issue.

RasterOps warrants the hardware for three years. Unlike Super-Mac, RasterOps offers no money-back guarantee with the Editing Aces Suite. Documentation is good, but not exemplary, and phone support is no longer toll-free.

Conclusions. The Editing Aces Suite offers a solid package of QuickTime hardware at a competitive price, and the MoviePak daughter-board should be especially appealing to QuickTime video producers on a tight budget and owners of compatible RasterOps video cards.

MediaTime's high-quality audio is an important asset, which should gain value with QuickTime 1.6 and Sound Manager 3.0, but superior

Editing Aces Suite vs. DigitalFilm

	EDITING ACES SUITE RASTEROPS CORP.	DIGITALFILM SUPERMAC TECHNOLOGY INC.
Movie capture resolution (pixels)	320 by 240	640 by 240
Still capture resolution (pixels)	640 by 480	640 by 240
Audio resolution	16-bit, 44.1-kHz stereo	8-bit, 44.1-kHz stereo
Monitor support	13-inch RGB (640 by 480 pixels) 1-through 24-bit depth	13-inch RGB (640 by 480 pixels) 16-inch/17-inch (834 by 624 pixels) 1-through 24-bit depth
Television/Mac monitor switching	Requires shutdown and recabling or multiscan monitor such as Sony CPD-1302	On the fly
Video standards (in/out)	NTSC, PAL, SECAM; either NTSC or PAL, depending on Video Expander II model; underscan and overscan	NTSC, PAL, SECAM; NTSC, PAL; underscan and overscan
Inputs	Composite, S-video, stereo audio	Composite, S-video, stereo audio
Outputs	13-inch Mac monitor, composite, component, S-video, stereo audio	13-inch or 17-inch Mac monitor, composite, S-video, stereo audio
Current draw	3.5 amps	4.0 amps
Software	Adobe Premiere 2.0.1, MediaGrabber 2.2 application; Extensions: RasterOps drivers 1.4, RasterOps VDIG 2.1, MoviePak 1.1	Adobe Premiere 2.0.1, DigitalFilm 1.1 control panel, Print to DigitalFilm and Diaquest 1.1, DQ-TimeCoder plug-ins for Premiere, DigitalFilm Player 1.1, CoSA After Effects, ALSoft DiskExpress II
Warranty/guarantee	3 years/no money-back guarantee	5 years/money-back guarantee
Other	output color bars, genlock, switchable video termination	accelerated graphics on Mac monitors (Thunder technology); genlock on composite output with software control; RS-422 serial control cable

Export to Video

Monitor: **RasterOps MediaTime**

Center on Screen
 Fill Entire Screen
 Hardware Zoom: **Best**

Black
 Other

Loop Movie

Delay before Starting **10** Seconds
 Delay after Ending **8** Seconds
 Show Color Bars for **5** Seconds
 Clear Screen at End of Movie

OK **Cancel**

RasterOps' MediaGrabber, part of the Editing Aces Suite, provides its own print-to-video capability, complete with the creation of color bars, background settings and more.

audio and still-image capture are balanced by a display adapter that is slower and less flexible than its competition.

In QuickTime performance, the Editing Aces Suite and DigitalFilm are comparable, although the character of their images differs slightly.

Both products share the current limitations of QuickTime and compression hardware, and these issues are more important than the differences between the products.

For video production, Premiere's Make Movie operation is a serious bottleneck, and image quality is

damaged in the digitizing process. Motion problems are difficult to avoid without using high-end Mac hardware and compromising image quality through further compression.

These limitations are less of an issue for multimedia production, however, and QuickTime excels at prototyping complex video transitions and effects on a budget. Overall, the Editing Aces Suite makes a good companion for QuickTime.

RasterOps Corp. is at 2500 Walsh Ave., Santa Clara, Calif. 95051. Phone (408) 562-4200 or (800) 729-2656; fax (408) 562-4065. □



ShirtPocket president offers observations

I would like to personally thank you for including EasyServer in your comprehensive file-server review (MacWEEK, May 10).

I'm sure all network managers realize the difficulty of undertaking a review of such a complex component of a computer network. I feel that the review was conducted in a fairly objective manner (especially considering the favorable light cast upon our product). However, I would like to make a few key observations concerning the EasyServer AFP (AppleTalk Filing Protocol) file server:

The EasyServer product line has not changed ownership. ShirtPocket Software Inc. remains the owner and developer of the

► Finally, after speaking with the technical-support group at COPS, we were unable to locate problem reports from your lab concerning difficulties encountered in running a database application. We currently have hundreds of customers running database applications on our servers, including ACI US Inc.'s 4th Dimension, without problems.

As your article mentioned, our product is sold as a software kit. We would welcome the opportunity to submit a version of EasyServer to run on your platform to compare Apples to Apples.

*Jay Eagleton, president
ShirtPocket Software Inc.
Mesa, Ariz.*

MacWEEK replies:

We were not notified that COPS was handling distribution and support for the EasyServer line until the end of the project. As a result, all support inquiries were directed to ShirtPocket, including the issues we had with 4D.

It is MacWEEK's policy to refer to the company that distributes a given product, not the manufacturer, as the primary vendor contact.

Send your comments to MacWEEK Reviews Department, 301 Howard St., 15th Floor, San Francisco, Calif. 94105. MCI (323-1203); fax (415) 243-3650. Include your name, address and phone number. We reserve the right to edit for clarity and length.

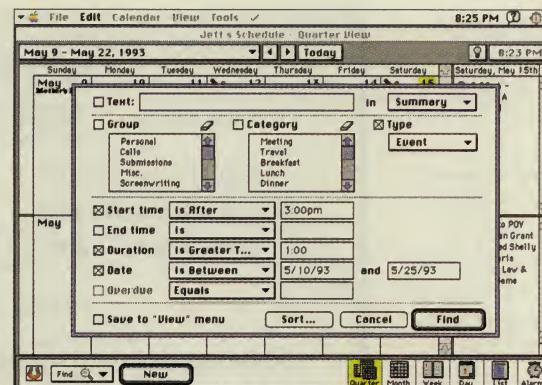
Datebook

From Page 47

cally improved printing support. Options include a Quick Print feature for every schedule item; customizable templates for printing days, weeks, months or quarters at a time; the capability to print single events; and the capability to print wall calendars of arbitrary size. Datebook Pro also includes a print-preview feature.

There are five ways to view your schedule in Datebook Pro: in a textual list or graphically in daily, weekly, monthly or quarterly views. (The quarterly view displays 13 consecutive weeks.) Unlike its competitors, Datebook Pro shows all three kinds of information items in every view. It does, however, let you place activities into groups and categories, so you can view only your "Personal/Project X" appointments, for example. But unlike Now Up-to-Date, you can isolate groups and categories only in the list view, not in the weekly or monthly calendar views.

Searching in Datebook Pro has been improved with the addition of the Searchlight feature. Although most scheduling programs (including Datebook Pro) let you search for items according to some set of criteria, Datebook's competitors list the results of the search in a textual list. Datebook's Searchlight lets you view the results of a search in any text or calendar view. Clicking on the Searchlight icon will highlight every matching day in the current view.



Interface lift. Most of the other changes to Datebook Pro are improvements to the user interface, making it more flexible, attractive and consistent.

Color icons, banners and program controls give Datebook Pro a slick 3-D look. Optional word wrapping in quarterly and monthly views makes item descriptions easier to read. For those with smaller screens, the palette at the bottom of the schedule is detachable, and the Business indicators at the bottom of each day's box in quarterly and monthly view are optional.

Holidays in Datebook Pro are flexible, providing a customizable list with independent options to display the holiday. Recurring events can be scheduled with a high degree of flexibility, but After Hours has thoughtfully created an easily accessible interface to this feature.

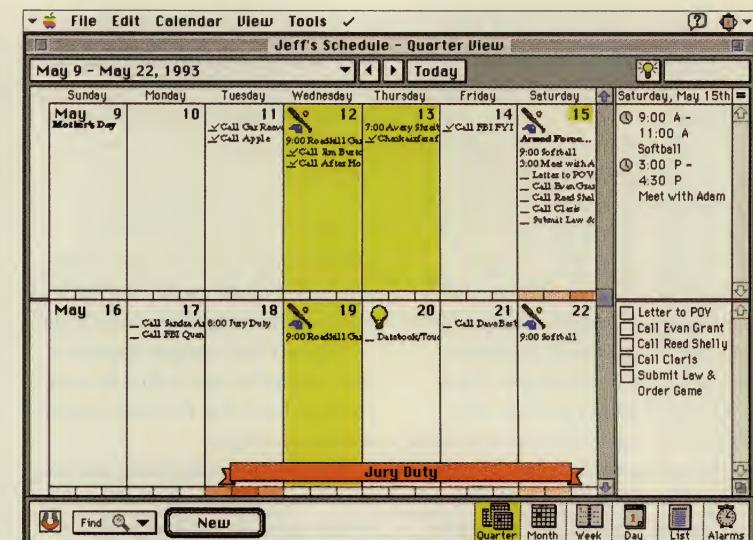
Navigation has also been improved, moving Datebook considerably ahead of Now Up-to-Date in this area. In addition to

Datebook's excellent Date Selector, Datebook Pro now supports a Go To command that lets you graphically select any day in the year with a double-click. Now Up-to-Date's more-limited navigation tools make it more arduous to move to a specific date outside of the current view.

Datebook Pro comes with a Mini-Datebook Pro version for those running with low memory or for spur-of-the-moment scheduling needs. This "lite" program, which can be accessed in any application by hitting a hot key or double-clicking in the menu bar, lets you create and view items, set alarms, and launch the full Datebook Pro application.

Datebook Pro includes an extension that manages alarms and notifies you of upcoming appointments.

Snags and snafus. A major difference between Now Up-to-Date and Datebook Pro is that the latter does not support group scheduling or multiple-schedule



Datebook Pro's Searchlight button lets you see the results of a search in any view. Here, the results of the search are displayed in the quarter view, which has been configured to display two weeks at a time. The Business indicators at the bottom of each day show how full the schedule is in each of three eight-hour periods in the day.

reconciliation. These items are on After Hours' development slate for a future version.

We experienced some crashes and lost Events after converting to Datebook Pro from the previous version of Datebook. A technical-support person at After Hours suggested that our schedule file had been corrupted, even though it worked in the older Datebook application, and Datebook Pro had appeared to have converted it without a problem. After we rebuilt the file, as After Hours suggested, the problems disappeared.

Datebook Pro, like Now Up-to-Date, does not allow you to stretch

regular Events across date boundaries (except for banners, which do not carry the normal attributes of an Event). To represent Events spanning multiple days, you'll have to use a work-around (possibly two Events to mark the start and end of the item or a recurring Event that spans multiple days).

Documentation and support.

The Datebook Pro manual has been extensively rewritten. It is clear and comprehensive and slanted more toward the new user than someone upgrading from a previous version.

Conclusions. Datebook Pro has come through its first major upgrade more flexible, powerful and attractive and has maintained its ease of use. The new Memo item is a welcome addition, and the enhancements to the interface add up to a significant improvement in the feel of the program. There is still room to grow, especially in support for group scheduling, which After Hours said is in the works. If you need this feature, then Now Up-to-Date is the best choice. Datebook Pro, meanwhile, is a very good personal time manager.

After Hours Software is at Tri Center Plaza, 5990 Sepulveda Blvd., Van Nuys, Calif. 91411. Phone (818) 780-2220 or (800) 367-8911; fax (818) 780-2666. □

After Hours' Pros work together

Datebook Pro and Touchbase Pro, both from After Hours Software, are very good programs on their own, but when used together under System 7, they really begin to shine as personal information managers.

The programs, available as a bundle for \$149.95, use System 7's Apple events to provide links to each other's data. Users with copies of both programs can upgrade to the new duo for \$39.95.

The most recent versions of Touchbase and Datebook could communicate with one another and swap some data. Communication, however, was limited to searching the other program's file and either copying an item such as a phone number or sending back a string to describe an Event. There was no linkage between the records, just movement of data.

With the recent upgrades, the Pros now have active links to each other's records. In Datebook Pro, you can link Events, To-Dos and Memos to a specific contact in Touchbase Pro by using the Touchbase button in the Item Detail dialog. When you click this button, you are presented with a dialog that lets you search a specific Touchbase Pro file for a contact.

Once linked, the contact's information is presented in a pane of the Item Detail window. The contact pane is displayed and maintained by Touchbase Pro. Clicking on a phone number in the pane causes Touchbase Pro to dial that number. You can also click on the icons in the pane to print an envelope, fax cover, de-

tailed view or FastLetter for the linked contact.

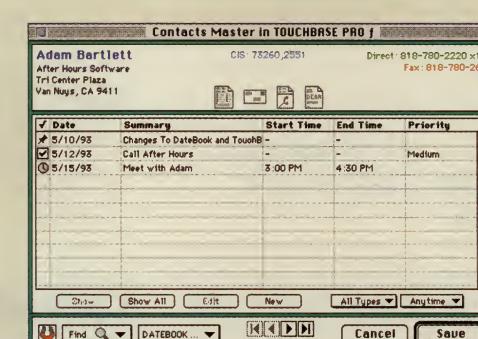
Finally, double-clicking on the pane brings Touchbase Pro to the front and opens the contact's record to be examined or edited. (For the power user, the pane displayed is actually the current Touchbase Pro header template for contacts. If you want more information or other icon buttons displayed in the pane, you can create and select a new header template in Touchbase Pro.)

Only one contact can be linked to any given schedule item, but After Hours is considering the ramifications of allowing multiple links for future versions of Touchbase Pro and Datebook Pro.

From within Touchbase Pro, users can access the Datebook page of a contact's record. Every Event, To-Do and Memo with which this contact has been linked is listed in the Datebook page (although you can filter the items if you want to see only a certain kind of item, or items that are in the past or the future).

You can create a new item by clicking on the New button; Datebook Pro will switch to the front while you edit the item in the Item Detail dialog, and Touchbase Pro will return to the front when you save the item. You can double-click on any item to switch to Datebook Pro and edit or examine it. You cannot, however, delete schedule items from this page of the contact record.

The flexibility in the Pros is far superior to the functionality available in past versions of Touchbase and Datebook. Although we find the Date-



The Datebook page of a Touchbase Pro contact record is available only when Datebook Pro is installed. By default, it lists all the schedule items with which the contact is linked, although the list can be filtered to include specific event types.

book page in a Touchbase Pro contact record to be useful (mainly as a reference guide to the contacts we have had with a person), the capability to link Touchbase contacts to a Datebook Pro schedule item is leaps and bounds ahead of the cut-and-paste functionality in the previous version.

After Hours sells Touchbase Pro and Datebook Pro as separate products, and each product fills its intended role well. (In late May, Aldus Corp.'s Consumer Division signed a letter of intent to purchase After Hours Software.) But taken together, these two products form a powerful and flexible personal information management system.

— By Jeffrey Sullivan

SYSTEM 7 COMPATIBILITY

Datebook Pro 2.0

Balloon help	No
TrueType	Yes
Publish and subscribe	No
Apple events	Yes
32-bit addressing*	Yes

*According to vendor.

After Hours makes solid contact with release of Touchbase Pro

Major improvements, including new fields, shortcuts and greater flexibility, make this worthwhile product even better.

By Jeffrey Sullivan

Ignoring the truism "If it ain't broke, don't fix it," After Hours Software has released a major upgrade to Touchbase, its popular personal contact manager.

Lest one suspect more bluster than muster, rest assured that the \$79.95 Touchbase Pro improves virtually every aspect of the already well-rounded product. It is more flexible and even easier to use, while packing in substantial new functionality. Upgrades from the previous version are \$24.95.

With this upgrade, Touchbase Pro is no longer available as a desk accessory (unlike its main competitor, Portfolio Software Inc.'s Dynodex 3.0, which still provides a stripped-down DA version). Touchbase Pro has graduated to a full-fledged application — a sizable one at that, requiring more than 800 Kbytes of disk space and at least 650 Kbytes of RAM. Although Touchbase Pro will run on any Mac with System 6.0.5 or later, System 7 is required for some of its advanced linking features, in particular its substantial integration with Datebook Pro (see story, Page 47).

Like Datebook, the previous (non-Pro) version of Touchbase will continue to be sold, through Performa channels only, at a retail price of \$64.95.

What's new. Touchbase Pro adds five new customizable fields to the 11 offered in Touchbase. The new fields provide two more checkboxes, another date and two new number fields. In addition to excellent automatic field formatting, Touchbase Pro fields can now have

shortcuts associated with them. Shortcuts can be used like the glossary feature of word processors, as a pull-down menu of frequent field fillers or as a pop-up menu that restricts field contents to one of its items.

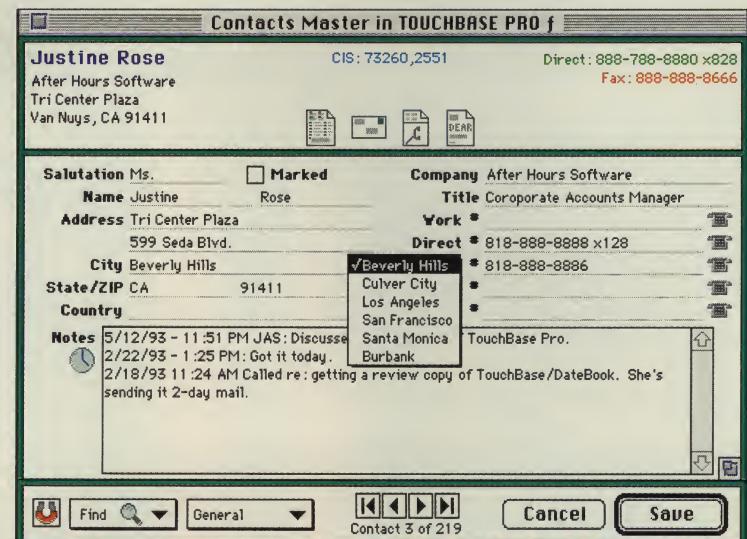
Unlike previous versions, Touchbase Pro allows you to have multiple contact files open simultaneously, letting you easily cut and paste contacts between files.

The new version features greater flexibility in entering and retrieving information. More actions within the program — such as dialing a number or printing a letter — are logged to a contact's Notes field with a time stamp. Touchbase Pro now supports compound searches of field contents (on unlimited fields rather than Dynodex's limitation of two fields per selection search). A new Views editor lets you create a menu of custom selections of contact files. For example, you can create a view called Salespeople that shows all contacts with the word "sales" in their title field.

Like Dynodex 3.0, Touchbase Pro offers a bare-bones text editor that lets you create memos, called FastLetters. Convenient integration with Touchbase Pro allows for easy mail merge and form-letter creation, but for a program with such tight integration, it's surprising that FastLetters cannot be linked to a contact.

New tools, but no Tools. Touchbase Pro has eliminated the Touchbase Tools application, rolling its functionality into the Tools menu, along with a slew of new features. In addition to the capability to convert Dynodex and Power Up! Software Corp.'s Address Book Plus files, permanently sort and reconstruct contact files, and transfer data to and from Sharp Electronics Corp.'s Wizard palmtops, Touchbase Pro now supports user-customizable duplicate-record checking, global search and replace of field contents, and the capability to compare two contacts and swap data between their fields.

Touchbase Pro supports the Personal Information Suite of Apple events, which an After Hours programmer helped define. The program is scriptable under AppleScript.



Field shortcuts can be supplied for any field in Touchbase Pro. They can work like a word processor's glossary, a pull-down menu that types the selection into the field or a pop-up menu that restricts field values to its items.

were generally much slower in Touchbase than in Dynodex.

Documentation and support. The Touchbase Pro documentation has been significantly rewritten, expanding its coverage of old features and addressing new ones. Users familiar with the old Touchbase might have a difficult time picking out the new feature documentation because it's not distinguished from previously existing features, but new users will find the manual very helpful and clearly written.

After Hours offers 180 days of free technical support for Touchbase Pro. Technical support can be received on CompuServe, America Online, AppleLink and via a toll call. Once we got through to it — not an easy task on its support line — After Hours was extremely responsive to our technical-support requests.

Conclusions. After Hours has done an outstanding job of upgrading one of the best personal contact managers available for the Mac. Touchbase Pro is a feature-laden, flexible and easy-to-use tool that fits its job like a key in a lock. Of course, we will be even happier once the minor glitches in the initial release of Touchbase Pro are cleaned up.

After Hours Software is at Tri Center Plaza, 5990 Sepulveda Blvd., Van Nuys, Calif. 91411. Phone (818) 780-2220 or (800) 367-8911; fax (818) 780-2666. □

Score card

Touchbase Pro

After Hours Software
Overall value **◆◆◆◆**

Version tested: 3.0

List price: \$79.95*

This impressive upgrade to one of the leading Macintosh contact managers provides more than just a new name. Touchbase Pro has been substantially revamped, making it easier to use and more flexible and customizable. New features include additional custom fields, file synchronization, field shortcuts, complex searches, multiple open contact files, a built-in word processor and AppleScript support. Some minor cosmetic glitches and bugs blemish the otherwise impressive quality of this upgrade.

Performance **◆◆◆◆**
Features **◆◆◆◆**

Ease of use **◆◆◆◆**
Documentation/support **◆◆◆◆**

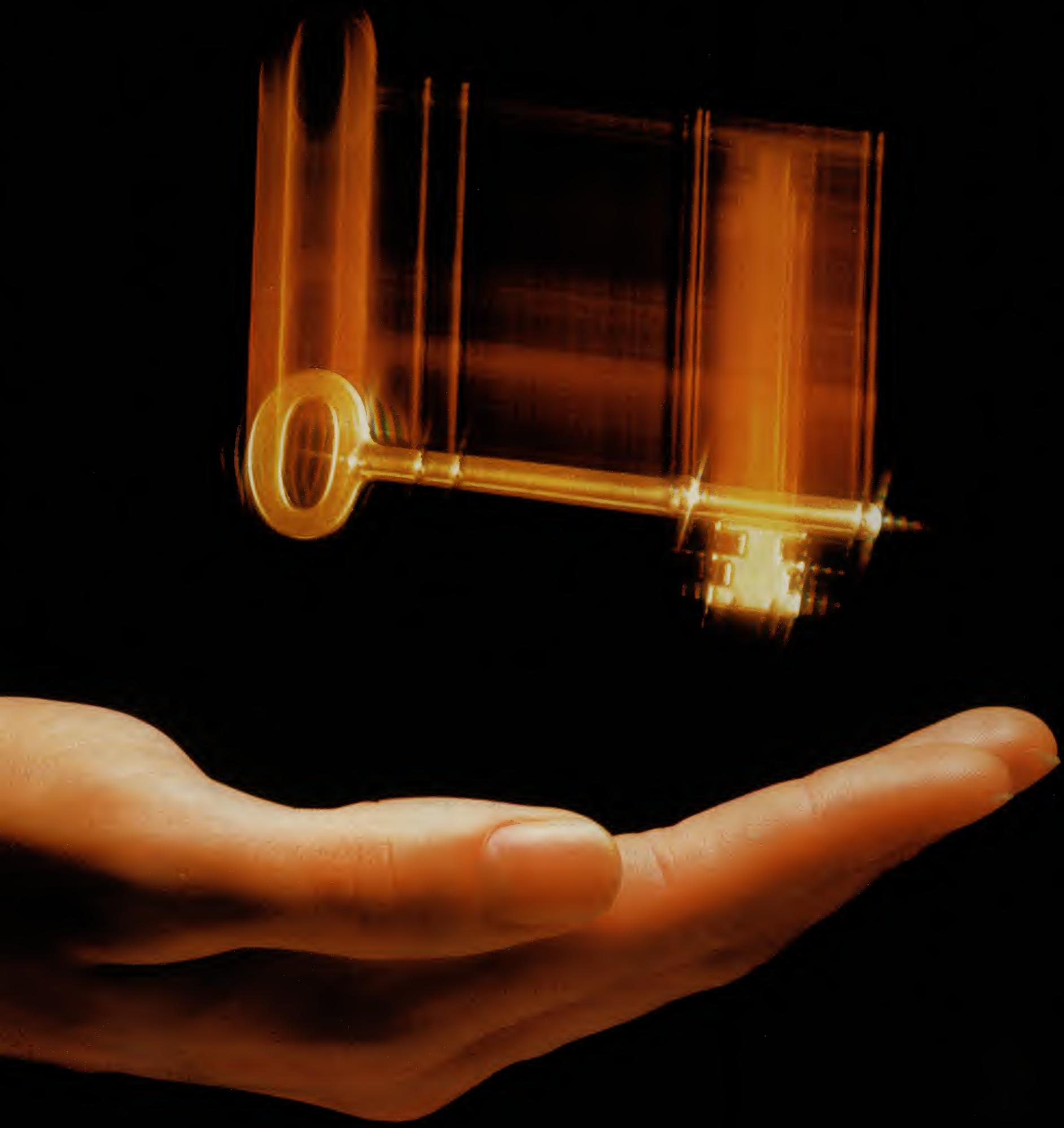
*Bundled with Datebook Pro, \$149.95. Upgrades from previous versions of Touchbase, \$24.95; owners of Touchbase and Datebook can upgrade both for \$39.95.

SYSTEM 7 COMPATIBILITY

Touchbase Pro 3.0

Balloon help	No
TrueType	Yes
Publish and subscribe	No
Apple events	Yes
32-bit addressing*	Yes

*According to vendor.





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1993 ~ The New ScanPartner Plus By Fujitsu

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PRODUCT WATCH

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Assembling the pieces in the groupware puzzle

Managers must look at many options when designing ways to improve work flow.

By Mitch Ratcliffe

The personal computer is a heads-down, shoulders-to-the-wheel machine that focuses users' attention on their own work rather than the goals of their company. Its office dominance has done little to streamline the flow of information in organizations.

Now a maturing generation of software, known as groupware, is lifting the blinders from Macs, IBM PCs and compatibles, and Unix computers, enabling the sharing of information, the tailoring of business processes, and the scheduling of people and resources.

Assess work-flow needs.

Before adopting groupware, managers need to take stock of their networks and the jobs computer users are trying to accomplish. According to users, the character of the applications chosen for an organization should come as close as possible to the working habits already in place.

Although a large growth area for workgroup applications is in specialized markets such as publishing (see story, next page), there are a number of products that can satisfy more general needs. These groupware applications fall into four categories: conferencing systems; real-time virtual work spaces and collaborative databases, which let workers collaborate on documents in a coordinated manner; resource-management programs; and work-flow software, which lets managers

design the flow of data, forms and documents through their offices.

Conferencing systems. Most Mac groupware installs in two pieces, including a client and a server component. In the case of conferencing systems such as Pacer Software Inc.'s PacerForum and MacVONK Inc.'s Inforum, a server collects and archives all data, which client Macs access over an AppleTalk network.

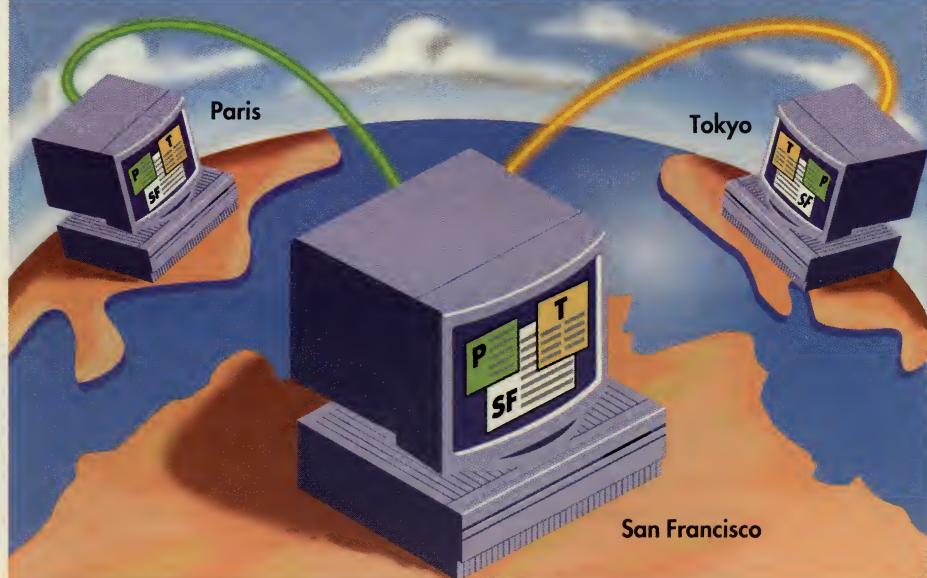
These programs take the rudiments of an on-line bulletin board system — the capability to upload and download information — and use it to put networked users in the middle of brainstorming sessions. Entire projects are stored under a clickable icon as ASCII text threads and attached to documents, graphics and QuickTime movies, which can be reviewed by forum participants.

The PacerForum and Inforum settings avoid the verbosity of their on-line ancestry. Because an entire discussion thread is stored under a clickable icon in the main screen, users need not include lengthy quotes of previous messages to provide context for their ideas.

Collaborative databases.

ON Technology Inc.'s Instant Update, provides two productivity environments, a word processor and a drawing program, where users can work on ideas and documents. Users send updates to the Instant

Real-time workgroup collaboration



NEVIN BERGER

Update server, which distributes the latest version to other users.

Digital debates. Syracuse (N.Y.) University uses PacerForum to conduct writing classes. "If a student misses class, they just come in after hours and pick up where the class left off," said Bret Ingberman, manager of the advanced applications group in Syracuse's computing services department. "The boundaries of time and space that we think of as a class period are breaking down."

A class discussion conducted via PacerForum allows students to participate in debates and group writing exercises using pseudonyms, which increases participation by otherwise soft-spoken students, Ingberman said.

Groupware has enabled a rash of other innovations at Syracuse University, including the encouragement of targeted discussion groups that provide feedback to teachers and students on grading and papers; the creation of instant archives of classroom debates; and plans for a campuswide system that will serve as a distribution point for homework, information and software upgrades.

Telemorphix Inc., an interactive production company in San Francisco, uses PacerForum to link employees in Europe, Asia and the United States. There is no central Telemorphix office; instead the company maintains multiple PacerForum servers, each dedicated to an individual project, which users access by dialing into the company's network through AppleTalk Remote Access.

According to Andy Harris, Telemorphix president and co-founder, the capability to share information among Telemorphix team mem-

bers makes the worldwide organization possible. "We use PacerForum to coordinate activities, then we can play it by ear," he said.

Real-time virtual work space. But Telemorphix cannot provide customer training and technical support through the Pacer interface. For this it turned to Farallon Computing Inc.'s Timbuktu, a cross-platform screen-sharing application that enables real-time collaboration. "Something that's incredibly difficult to explain over the telephone is easy to show when someone is able to look at the same screen," Harris said.

Timbuktu is available for Mac and Windows machines. Data-watch Corp.'s ScreenLink, available only for the Mac, also allows real-time screen sharing.

Putting two or more machines in touch with a networked document takes a company the next step up the interactivity scale; real-time collaborative applications break the bounds of geography to bring people together in a virtual work space.

Group Technologies Inc.'s Aspects has found a following in companies with widely distributed teams that want to work in the dynamic atmosphere of a live brainstorming session (see story, left). The application loads on individual Macs, which communicate over an AppleTalk network or via modem. Two or more Aspects users can work simultaneously in a word processor or drawing document. Individual user input is signified by a unique cursor shape or color.

"It puts you in a face-to-face mode," said Neil Drake, process specialist at Dow Chemical Co. in Midland, Mich. Drake said he uses

Virtual work spaces, such as Group Technologies' Aspects, let remote users participate in real-time brainstorming discussions. Individual Aspects users are identified by unique cursors or colors (see story below).

How Dow uses Aspects for global collaboration

The Dow Chemical Co. in Midland, Mich., uses Group Technologies Inc.'s Aspects to draw on the skills of a worldwide pool of engineers and analysts without racking up huge travel bills.

"A flight to Europe for a meeting costs \$2,000 to \$3,000," said Neil Drake, process specialist for the company. "We've had long meetings using Aspects for a fraction of the cost of a face-to-face meeting."

Aspects' drawing and word processing tools are used during conference calls between people at various Dow sites, Drake said. Work is usually done in a word processor or drawing program then imported into Aspects for group editing and tweaking.

"We can annotate, make changes and

everyone walks away with their own copy of the final results," Drake said. But he also pointed out that the problems on which the distributed team works sometimes must be modified to fit into Aspects tools' limits.

Drake said other screen-sharing software lets users work with a wider variety of applications than Aspects, but they require more bandwidth to give equivalent performance.

Dow also uses ON Technology Inc.'s Instant Update to work on some projects. Instant Update requires that each user with access to documents be added to the group of approved users by an administrator, which allows Dow added proprietary information security. — By Mitch Ratcliffe

See Groupware, next page

Groupware *From previous page*

ResEdit to create cursors that include the initials of each Dow office in an Aspects session.

Making the choice between the real-time capabilities of Aspects and the store-and-forward data features of PacerForum, Inforum or Instant Update is a matter of trusting one's intuition about how a team works best together. Users said they tended to favor the server-based products for extended projects, especially when they want to create an audit trail or project archive.

Resource management.

Groupware can reach outside the realm of bits and bytes to help manage the physical and human resources of an organization. Resource-management applications let groups refer to a central database of meetings, reference materials such as books and periodicals, and employee in/out boards without having to leave their desks.

Meeting Maker from ON Technology is finding a niche as a supplement to other collaborative software by many companies moving to groupware. Meeting Maker 1.5 is a Mac server-based scheduler that lets users propose meetings, select conference rooms and equipment, and send agendas to invitees.

The latest version, Meeting Maker XP, runs on Mac or Windows-based servers and clients, and it allows laptop users to modify their schedules while they roam and send updates to the server when they reconnect to a network. XP runs on AppleTalk or Novell Inc.'s Internetwork Protocol Exchange network protocols.

Another scheduling alternative is Now Software Inc.'s Now Up-to-Date. Unlike Meeting Maker, which lets users share information between individual calendars, Up-to-Date calendars are a central sche-

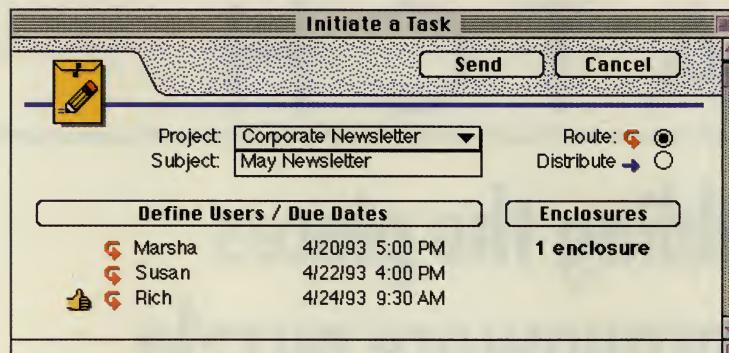
dule that many users can modify. Individual users can create a calendar for their own schedule or a conference room, and their co-workers can avoid conflicts by checking it before proposing a meeting.

Some applications take group scheduling a step further by integrating scheduling features with electronic mail. Microsoft Schedule Plus uses the Microsoft Mail 3.0 server to facilitate group scheduling. Schedule Plus also allows the use of tentative scheduling so that meetings are not posted to all members' calendars until confirmed. Its graphical conflict-checking feature makes scheduling group meetings easier by providing graphical charts showing workgroup schedules.

WordPerfect Office integrates E-mail; scheduling; and the delegation, assignment and tracking of tasks. WordPerfect is expected to release versions of Office for VAX/VMS, Unix and OS/2 in addition to those for Mac, DOS and Windows. The simplest solution to tracking the availability of people and resources is Milum Corp.'s Office Tracker, according to Stan Stanart, staff engineer at McDonnell Douglas Space Systems' Space Station Division in Houston. An electronic, networked in/out board, Office Tracker lets groups track the comings and goings of people and resources.

"We use it only for people right now, but we intend to try it for [tracking] books and a tape library," Stanart said.

Work flow. Helix Technologies' Tracker is a work-flow and document-management product based on Helix Express relational database client-server technology. Tracker allows users to send tasks, comprising due dates, instructions and documents, to other users in a workgroup. A task initiator can



Helix Technologies' Tracker lets users assign tasks and track document flow. Tasks can contain deadlines, attached files and notes to individual group members.

check the status of the task at any time, reroute it or notify users when changes are needed. Tracker keeps an audit trail for each task and provides a document storage area on the server. Lotus Development Corp.'s Notes is an application for sharing information between networked users. Macs, Windows workstations and, soon, Unix machines can exchange information created in other applications and platforms or in a Notes discussion database, which functions like PacerForum.

Notes is catching on in many corporations, and a variety of third-party developers are building on its basic capabilities. The development of forms routing, fax gateways and database-access tools is substantially broadening the scope of shared information and services.

"The power of Notes is the availability of the same user interface across a wide range of applications," said Judy Ruffing, an analyst at a Washington, D.C.-based knowledge company.

It is particularly notable, Ruffing said, that the Notes format is drawing information publications, such as SandPoint Corp.'s electronic version of The Wall Street Journal.

"The information at the desktop is the 'carrot' that entices people to use Notes," Ruffing said. "However, the collaborative power of Notes is really why we use it—to connect task forces of leading experts. The capability to collaborate and build a consensus across organizational and geographic boundaries is tremendous."

Installing Notes takes a big commitment. Every user in an organization and the network itself, through the installation of an IBM OS/2-based server, must be converted to Notes, if it is to become useful.

"It's hard to measure Notes in terms of its costs and benefits," Ruffing said. "If you measure it in terms of the value to a person who's getting information and the capability to retrieve information faster than through older systems, then it's invaluable."

Data-flow design. Optix Workflow, an imaging and document-routing system from Blueridge Technologies Inc., is a

groupware application that purports to tie together the organizational information flow. Its components include work flow, optical character recognition, document imaging, full text search, archive and retrieval, and fax. Work-flow features include parallel routing, the capability for several users to work on a document simultaneously. Notes is another possible choice for companies wanting to integrate the creation and routing of information—and it will support scheduling features.

South San Francisco, Calif.-based Genentech was the first user of Optix Workflow, which it uses to import 10,000 to 15,000 pages of written medical documentation into its electronic information-processing system each month. According to Stu Nixon, manager of biomedical information at Genentech, the company has cut copying and archival storage costs tremendously and has simplified personal filing for employees.

Workflow lets users scan in doctors' notes, medical charts and other information, then create a routing form that directs the data from person to person in the company. At Genentech, for instance, information is collected for drug studies, analyzed by a series of people, then packaged automatically by Workflow for delivery to the Food and Drug Administration.

Nixon said the Workflow system demands that users think more creatively about how information is collected and used. The result is a data flow optimized to the particular requirements of each study and, he said, that leads to far greater productivity.

"The system paid for itself in only a few months," he said. But measuring its exact effect on the organization has been difficult. "The problem is the variability in the metric. We never do the same case study twice, and if you look at it from a before-and-after perspective, well, we're different after every case."

Room to grow. "The problem with all these groupware applications is that none of them integrates everything I need," Nixon said. He said even the most comprehensive applications lack resource scheduling.

See Groupware, Page 58

Mac work-flow systems ease deadlines for publishers

Finding the right software to fit the specialized needs of an organization is often the most difficult part of designing a work-flow system. The lack of comprehensive groupware packages available for the Mac means managers must piece together a groupware system from individual parts that may or may not work together.

Organized work flow is especially critical to the publishing market, where a task can change hands under hourly deadlines. Publishing has long fueled a market for proprietary mini- and mainframe-based editorial management solutions, and recently vendors have brought editorial work-flow products to the Mac. These systems combine scheduling, document tracking and archiving, security, and integration with page-layout and word processing applications.

Mac-based editorial-management system vendors include Quark Inc. of Denver; Digital

Technology International of Orem, Utah; Linotype-Hell Co. of Hauppauge, N.Y.; Managing Editor Software Inc. of Elkins Park, Pa.; Atex Systems Inc. of Billerica, Mass.; P.Ink America Corp. of New York; North Atlantic Publishing Systems Inc. of Chelmsford, Mass.; and Ideas to Print Inc. of Naples, Fla.

The Christian Science Monitor newspaper in Boston has used QuarkXPress to lay out the paper for four years. Soon, it will move from a proprietary Atex management system to using Macs and Quark Copy Desk, as part of the company's move to the Quark Publishing System, according to Carol Hartman, graphics system manager for the Christian Science Publishing Co.

QPS will save as much as a half hour on the production of each page.

"We'll be able to keep editing right up to the moment we print," she said. "That is critical to covering late-breaking news." —By Mitch Ratcliffe



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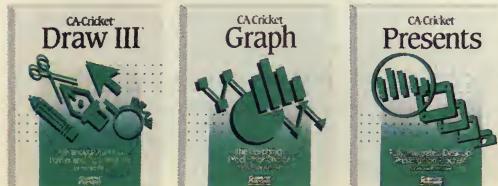
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Groupware

From Page 56

"I've got WorkFlow running on the same screen with Meeting Maker and (Digital Equipment Corp.'s) All-In-One Mail," Nixon said. "None of them talks to one another; I talk to them all."

Even if no single work-flow solution can currently satisfy an organization's every need, users said comprehensive work-flow applications, such as Optix Workflow and Notes, work wonders and have wrought profound changes in their organizations.

In fact, the sharing of information and tracking resources is becoming mandatory as companies deal with ever larger amounts of data. Systems that reduce the time needed to process data will give companies an advantage in these data-soaked days, users said.

Experts said analysis and insight are the most valuable currencies in the information economy, and groupware intelligently applied to an organization's needs is an invaluable solution for quickly getting to the kernel of value in data. □



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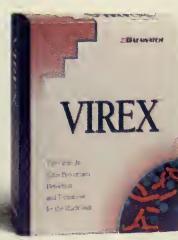
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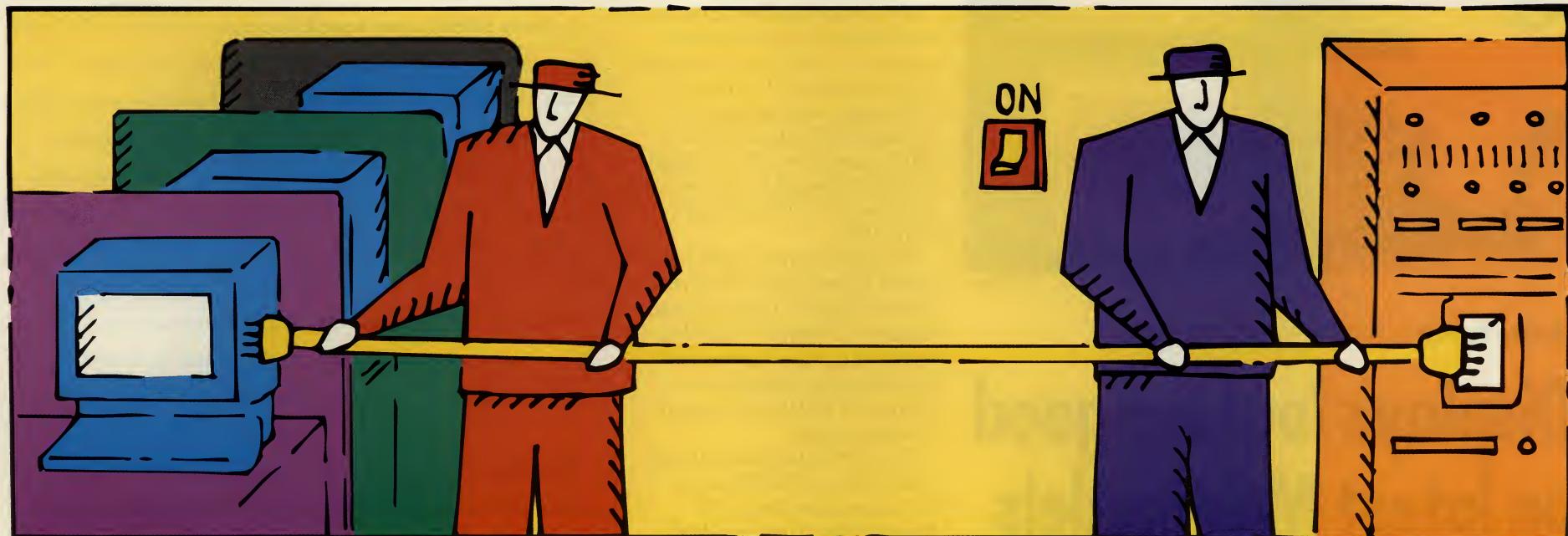
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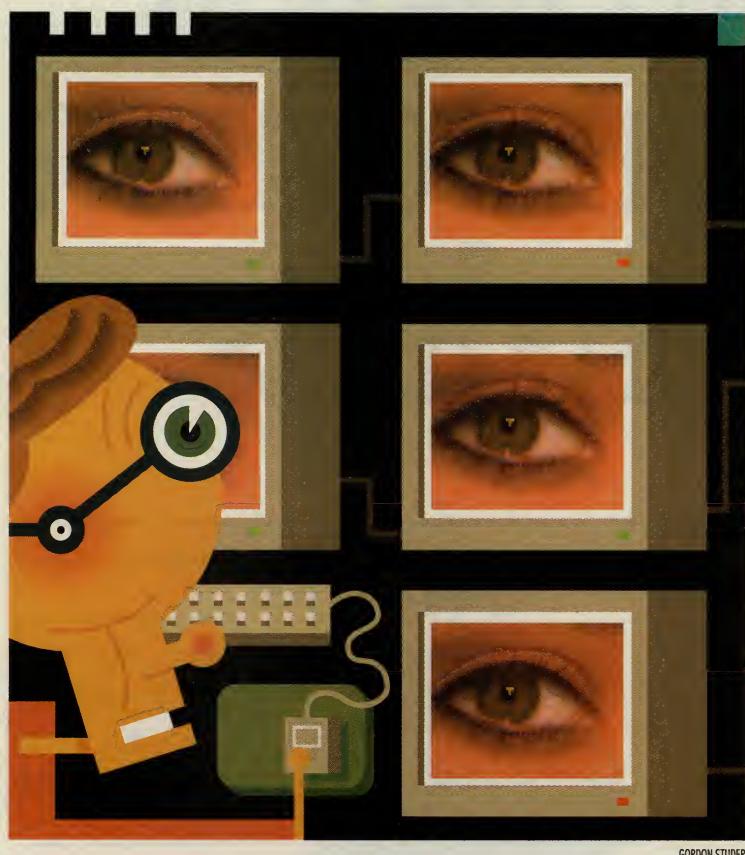
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GORDON STUDER

MacInTouch RIC FORD

Displays looking good on latest Mac models

We take a video tour of the newer Mac models, examining the details of their improved on-board display capabilities and a few of the issues involved.

BUGS & TIPS

Speed on the cheap. One of the joys of Apple's 68040-based Macs is their vastly improved graphics performance. The Quadra and Centris models leave the IIci and IIsi in the dust when it comes to display performance; only the fastest accelerated NuBus cards offer comparable speed.

Flexibility has also greatly improved. Right down to the inexpensive Centris 610, the new models can drive a variety of monitors up to 21 inches in size. Their circuitry can also output RGB (red, green, blue) television signals at both NTSC and PAL (European) timings. Older Macs could not even drive a 16-inch monitor, and they lacked the ability to produce TV signals.

The few limitations in the new

on-board display hardware mostly affect graphics professionals who need 24-bit color on large screens.

The Quadra 800 and Centris models have a maximum color depth of 16 bits per pixel for monitors up to 16 inches and eight bits per pixel for larger monitors and monochrome monitors. They lack hardware for 24-bit "true color," as a trade-off for low cost and high performance.

For most applications, 16-bit color is fine, and it matches QuickTime video well. Much richer than eight-bit color, 16-bit color is also much faster than 24-bit color because it involves only half the data. (The 16-bit mode uses five bits each for red, green and blue, plus a spare "alpha-channel" bit. The 24-bit mode assigns eight bits for each color, plus another eight bits for the alpha channel — a total of 32 bits per pixel.)

Comments on MacInTouch are welcome at 7 Parmenter Ave., Maynard, Mass. 01754. Phone (508) 897-2621. Address electronic mail to RICFORD on AppleLink or MCI Mail; to 72511,44 on CompuServe; or on the Internet to 72511.44@compuserve.com. Join us on-line in the MacWEEK Forum at location ZMC:MACWEEK on CompuServe or ZiffNet/Mac.

The Centris models and the Quadra 800 are also missing "convolution" hardware, a feature for reducing the flicker that results from converting certain types of graphics (such as one-pixel horizontal lines) to interlaced television signals.

Richer memories. The Quadra 700 and 900 offer 24-bit color on monitors up to 16 inches in size and eight-bit color on larger monitors. These Quadras lack a 16-bit mode, with its effective compromise between speed and depth, but they support convolution for video (at depths up to eight bits).

The Quadra 950 offers the best features of all, with high-performance circuitry for 24-bit color on monitors all the way through 19 inches and 16-bit support even on Apple's 21-inch display. The Quadra 700 and 900 lack support for a 19-inch display (1,024 by 768 pixels), but it is covered in the Centris models and Quadra 800 and 950.

A penalty for greater color depth in the Quadras is their demand for more video RAM. Their maximum capacity — 2 Mbytes — is double that of the Centris machines and the Quadra 800. (Note that 1.5 Mbytes of VRAM is not a supported configuration.)

The Centris 610, Quadra 700 and Quadra 900 need VRAM rated at 100 nanoseconds or less in 256-Kbyte SIMMs. (The same SIMMs were used in some models of the Mac LC and also used to upgrade the Apple 4×8 video card to an 8×24 card. The dynamic RAM used on the 8×24 GC card is incompatible with the Quadras, and they do not accept the 512-Kbyte SIMMs used for expanded VRAM in the Mac LC.)

The Quadra 800 and 950 and Centris 650 need faster, 80-nanosecond VRAM SIMMs, also in the 256-Kbyte size, and the video design of these machines provides better performance than the circuitry of earlier Quadras.

The low end. Even at the low end, monitor support has improved since the days of the IIci and IIsi. The weakest support, in the IIvx (and Performa 600), uses 100-nanosecond VRAM to provide up to 16 bits of depth on a 13-inch monitor. Larger monitors and television output are not supported. Either 256-Kbyte or 512-Kbyte VRAM SIMMs may be installed.

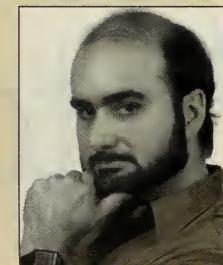
The LC III is a little more flexible. It uses 80-nanosecond video RAM and supports 16-inch monitors and portrait displays but at a maximum of eight bits of depth. Expansion is limited to a 256-Kbyte VRAM SIMM for a total of 768 Kbytes.

With the added VRAM, the LC III handles 16-bit color on a 13-inch monitor. An option in the Monitors control panel lets you get

Ask David Ramsey

The search for CPU truth

As we saw last week, coming up with a useful cross-platform benchmark isn't easy. Addressing this issue is the Systems Performance Evaluation Cooperative, a nonprofit group that devised a suite of programs to be a standard measure of computer performance.



Is there a SPEC in my soup? The group's rating, the SPECmark, is the arithmetic mean of the results from running the programs. The original SPEC suite was published in 1989 and produced a single number; a revised suite appeared in late 1991 and produces two ratings: SPECint (for integer performance) and SPECfp (for floating-point), which can be combined into a single SPECmark. (The SPEC figures are normalized, with a DEC VAX 11/780 supermini being 1. This just goes to show how fast our micros are these days.)

While the SPEC suite isn't the perfect performance metric — it's still affected by peripherals, configurations and compilers — it's widely used and is one of the best tools available for comparisons.

The chips are down. All of which begs the question of which versions of which Intel Corp. and Motorola Inc. chips should be compared. The 68040 is similar to Intel's "clock doubled" 486DX2 series; the main difference is that the 486DX2 synthesizes the higher clock speed internally, while the 68040 uses a separate processor clock signal that's twice the frequency of the stated system clock. Thus a 33-MHz 68040 in a Quadra 800 or 950 is roughly comparable to a 66-MHz 486DX2.

The results: As expected, a 33-MHz 68040 handily trounces the 33-MHz 486DX with a SPECmark of 20.3 (Motorola's figure) to 11.2 (a figure found by various magazines). Even the 50-MHz 486DX with its 17 SPECmarks is left in the dust.

But the 66-MHz 486DX2 takes first place with a score of 24.

The 66-MHz 486DX2 wins in my experience and SPECmark measured speed. For now, the ultimate in mainstream computing horsepower is a 66-MHz 486DX2 platform, preferably with 256 Kbytes of cache RAM, an accelerated video card and a decent hard disk system.

Please send questions to David Ramsey on CompuServe: 76702,335 or to Ask David Ramsey, c/o MacWEEK, 301 Howard St., 15th Floor, San Francisco, Calif. 94105.

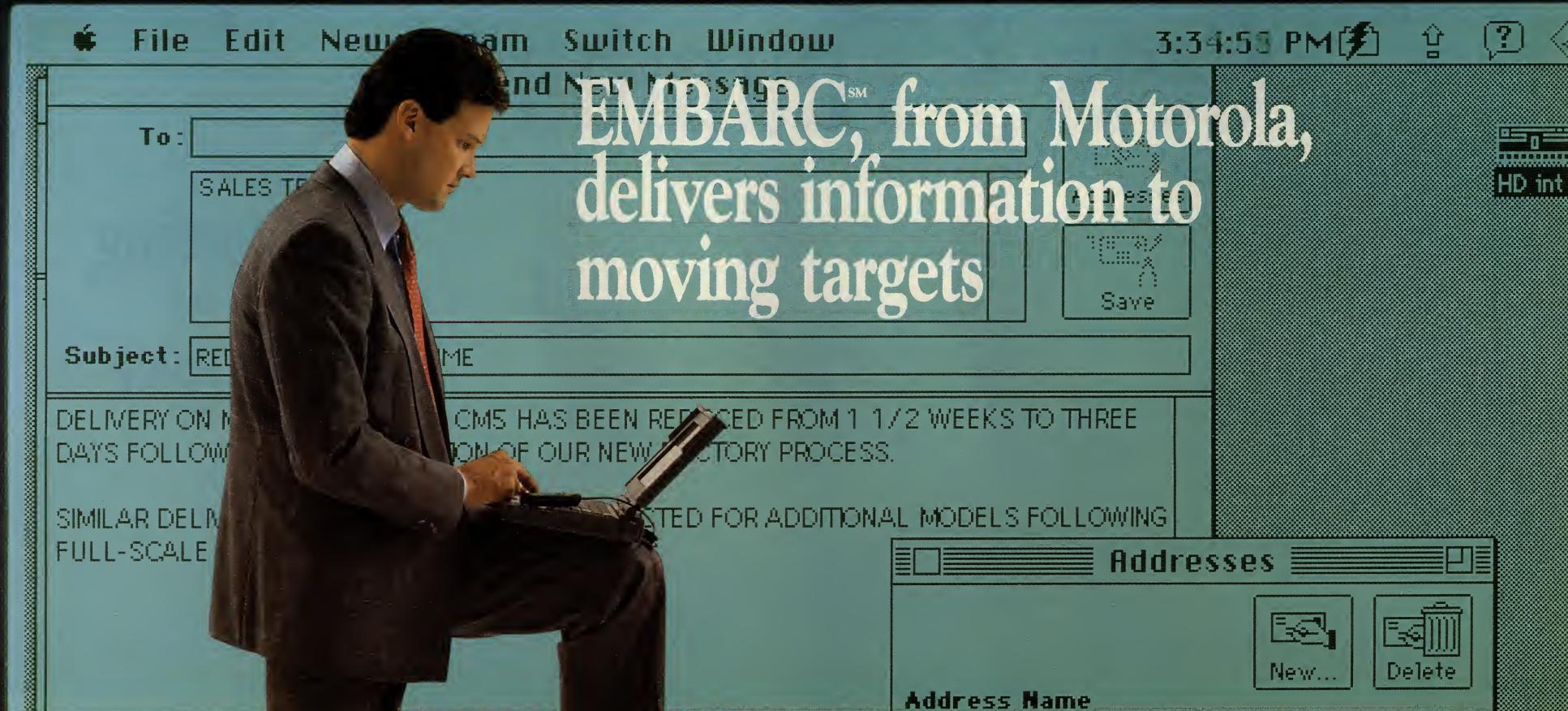
16-bit color, even with the standard 512 Kbytes of VRAM, by shrinking the screen to PowerBook size.

Foreign interests. In addition to other standards, Apple supports IBM PC and compatible monitors with its current on-board video circuitry. The IIvx and LC III offer VGA compatibility, and the 68040 machines add Super VGA, too.

All of Apple's video circuitry is controlled by the cable that joins the

monitor and video port. The video port analyzes the electrical characteristics of three pins on the cable to determine what monitor is connected, so using the proper cable is critical. Television output requires certain cable configurations, a 16-inch monitor needs one cable, and a 13-inch monitor needs yet another.

With their new flexibility, the latest Macs can support many third-party monitors, although you may need to make a custom cable. □



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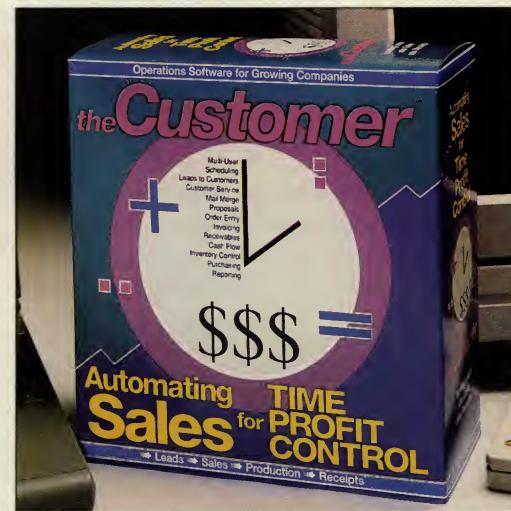
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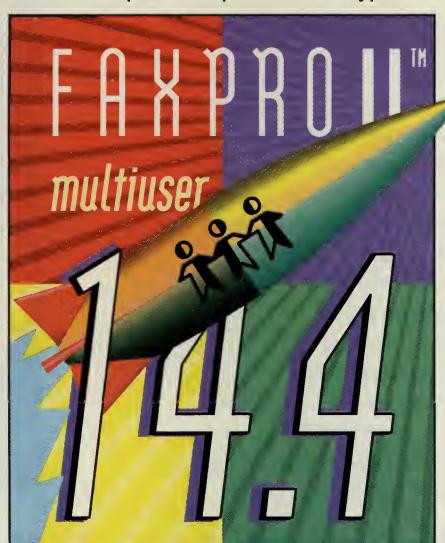
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AppleLink: CYPRESS

BookEndz PowerBook docking station



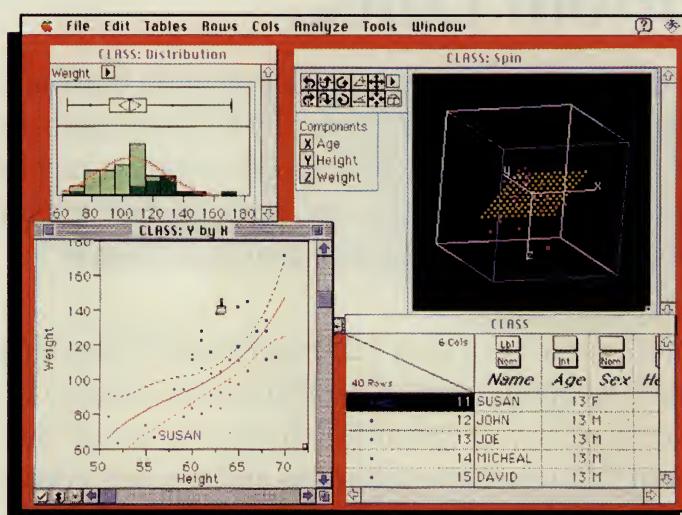
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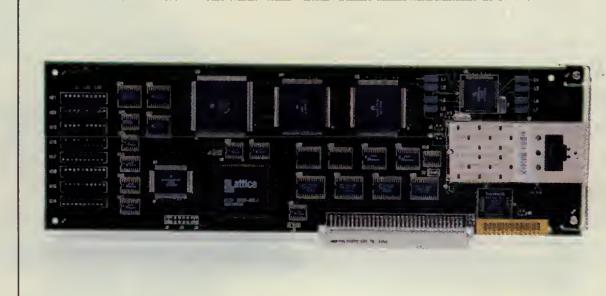
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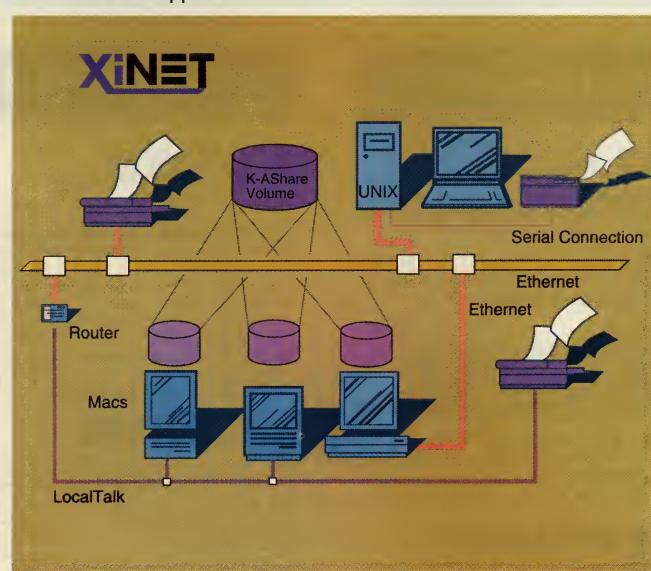
Spectra Systems Corporation

2001 Westside Parkway, Ste. 125
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Integrates Macs with Sun, S.G.I., H.P.

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- Files stored on the UNIX server appear as icons to Macintosh users, allowing users to stay in their familiar environment.
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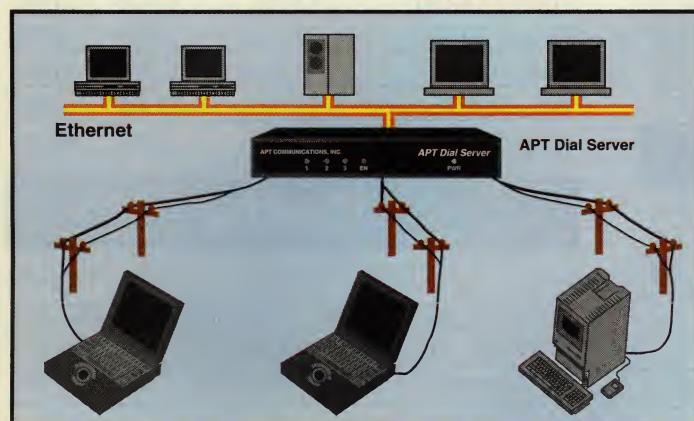


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How fast is a Mac IIci on TokaMac®?

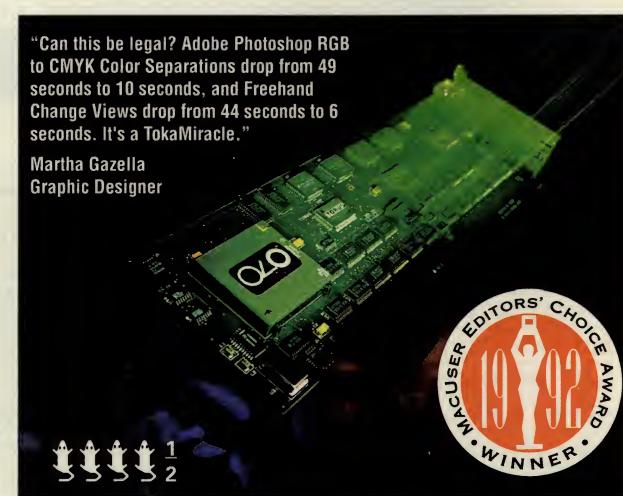
Way fast. Faster than a bullet. Faster than a rocket. MacUser Magazine Editor's Choice (Jan. '93) for Best Accelerator of the Year is TokaMac® — with the blazing speed of a Quadra 950.

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MacWEEK 5/17/93

"Can this be legal? Adobe Photoshop RGB to CMYK Color Separations drop from 49 seconds to 10 seconds, and Freehand Change Views drop from 44 seconds to 6 seconds. It's a TokaMiracle."

Martha Gazella
Graphic Designer



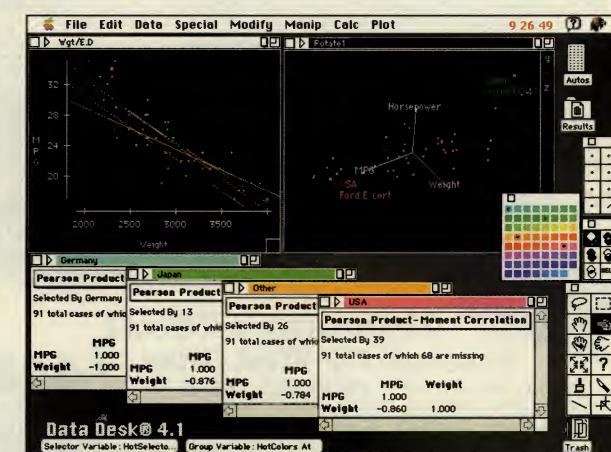
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Model	Without FPU	With FPU
33 MHZ Powercache	\$375	\$465
40 MHZ Powercache	\$545	\$635
50 MHZ Powercache	\$714	\$845
Powercache Adapter		\$40
Fast Cache Quadra 700, 900		\$249
Fast Cache Quadra (all)		\$375
33 MHZ Turbo 040		\$1345
Fast Cache Turbo 33-128k		\$179
Charger for Photoshop		\$799

SyQuest

Unformatted Capacity	Access Time	Price
Includes one free cartridge (2 year Warranty)		
44 mb External	19 ms	\$378
88C mb External	19 ms	\$568
105 mb External	14.5 ms	\$728



CD ROMS



Airbourne's Texcel External CD-ROM Drive \$448
265ms, Multisession, DualSpeed, SCSI-II

Toshiba 3401 Ext Drive \$498
200ms, Multisession, DualSpeed, SCSI-II

NEC Intersect Ext Drive \$169
625ms, Model CDR 25, Single Session, Single Speed, SCSI-I

Note: Bundles are only for sale with purchase of an Airbourne CD-ROM Drive

Reference Bundle

- The New Grolier Multimedia Encyclopedia
- World Atlas • CIA World Fact Book

89.00

Education Bundle

- MACnificent 7 Education & Games for System 7
- Mayo Clinic • U.S. History

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- Font Fun House • Font Pro Vol. 1/The Essentials
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Modems

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All units come with MacFAX & MacKnowledge Software	Price
Ultima Home Office ext 14.4/14.4SR Fax w/ V.42 bis & voice	\$398
Promodem 144i Internal for Powerbook 14.4/14.4SR Fax w/ V.42 & V.42 bis	\$268
Promodem 144e ext 14.4/14.4 SR Fax w/ V.42 & V.42 bis	\$258
Promodem 24e ext 24/96SR Fax w/ V.42 & V.42 bis	\$128
Promodem Mini 2400 2400 BPS mini, data only	\$79

ZOOM TELEPHONICS

All units come with Microphone LT & STF FAX Software	Price
Faxmodem PBK for Internal Powerbook 96/48 SR Fax w/2400 BPS Modem	\$99
Faxmodem PKT Portable 96/48 SR Fax w/2400 BPS Modem	\$109
Faxmodem FXV V42 bis/MNPS/2400 BPS, 96/96 SR Fax	\$129
Faxmodem VFX V.32 V.32 bis, 14.4 data & fax, V.42 bis/MNPS	\$258

Scanners

UMAX

All Scanners includes free software	Price
Model	
UC630 - Color w/free Photoshop v2.5	\$1078
UC1200s - Color w/free Photoshop v2.5	\$2948
UC840 - Color w/free Photoshop v2.5	\$1248
Transparency Unit	\$698
Auto Document feeder	\$398
UG630 - Greyscale w/free Typewriter OCR, OFOTO & Publish It	\$848

Optical & DAT Drives

Includes one free disc (1 year Warranty)

128 mb Panasonic Optical	39 ms	\$838
128 mb Epson Optical	29 ms	\$988
256 mb Most Optical	31 ms	\$1598
Unformatted Capacity W/Retrospect W/Retrospect Remote Includes free 90m Tape & Retrospect or Retrospect Remote software		
WangTek 2.1 Gig DAT	\$998	\$1198
WangDat 5.0 Gig DAT	\$1298	\$1498

Memory

Model 60 NS 70 NS 80 NS

1x8 Call \$37 Call

4x8 Call \$137 Call

16x8 Call \$555 Call

We carry most Mac Memory, Please Call for prices!

Memory for LCIII, Centris 610, 650

4mb \$139 8mb \$279 16mb \$599

Hard Drives

CONNER

Unformatted Capacity	Access Time	Internal	External
3.5" Disk Drives (2 year Warranty)			
85 mb LPS	17 ms	\$178	\$238
170 mb LPS	12 ms	\$248	\$298
212 mb LPS	9 ms	\$318	\$378
540 mb	8.5 ms	\$848	\$898

QUANTUM

ELS Series (3.5" Low Profile and Low Power Drives)	Price
85 mb	17 ms
127 mb	17 ms
170 mb	17 ms
LPS Series (3.5" Low Profile and Low Power Drives)	
240 mb	10 ms
525 mb	10 ms
Prodrive Series (3.5" Half Height Drives)	
1.0 Gig	10 ms
1.2 Gig	10 ms
GO-Drive 2.5" Hard Drive (All Quantums - 2 year Warranty)	
160 mb	17 ms

TOSHIBA

3.5" & 2.5" Disk Drives (2 year Warranty)	Price
2.5" 213 mb	12 ms
3.5" 830 mb	12 ms
3.5" 1.2 Gig	12 ms

FUJITSU

3.5" & 5.25" Disk Drives (5 year Warranty, 3 year on 105mb)	Price
3.5" 105 mb	9 ms
3.5" 520 mb	9 ms
3.5" 1.1 Gig	8.5 ms
5.25" 1.2 Gig	11.5 ms
5.25" 2.06 Gig	11.5 ms
5.25" 2.4 Gig	11.5 ms

SEAGATE

3.5" Half Height Drives (1 and 5 year Warranties)	Price
1.2 Gig	10.5 ms
Wren and Elite Series (5.25" Full Height Drives)	
Wren 8 1.6 Gig	15 ms
Wren 9 2.1 Gig	12.5 ms
Elite 1 1.6 Gig	11.5 ms
Elite 2 2.4 Gig	11 ms
Elite 3 3.4 Gig	11 ms

Media

Model	QTY 1	5PK	10PK
SyQ44 cart	\$67	\$65	\$63
SyQ 88 cart	\$107	\$104	\$99
SyQ 105 cart	\$79	\$76	\$72
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Samsung 14" Monitor	\$349⁰⁰
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NETWORKING

MacNet:

SE/30 and IISI 3 in 1 Combo Card*	\$130⁰⁰
SCSI 3 in 1 with Cable*	SAVE
SCSI 3 in 1 PowerBook Cable*	SAVE

* Above cards have 64Kb of static RAM

IEEE compatible, thick, thin, or 10 baseT

LC 10Base2/T Card	\$130⁰⁰
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Repeaters and concentrators are available.

UPS SYSTEMS

APC UPS 110SE	\$229⁰⁰
APC UPS 370ci	\$359⁰⁰

Other models available.

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Mass Micro 128Mb	\$1,259⁰⁰
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Cartridges available.

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Mass Micro DataPac 88 R/W*	\$619⁰⁰
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Cartridges available. (*reads and writes 44 or 88Mb cartridges)

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14,4/14,4 Pocket Fax Modem	\$376⁰⁰
Prometheus:	
Home Office Voice Modem	\$180⁰⁰
Ultra Home Office Voice Modem	\$369⁰⁰

PRINTER UPGRADES

Samsung Image 1200 Kit	
Upgrades Finalé 8000 to 1200 DPI	\$899⁰⁰

VIDEO CARDS

SuperMac:	
Thunderstorm for Photoshop	\$629⁰⁰
Thunder24	\$2,159⁰⁰
Spectrum 8-24 PDQ Nubus or IISI	\$789⁰⁰
Spectrum 8 Series III Nubus	\$399⁰⁰
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256 MB 3.5" Series X	fast 30ms access, read/write 128mb compatible, includes cartridge	\$1598
600 MB Hyperspace 5.25"	28ms Access time, 1MB/sec Trans, free cart.	\$2598

\$998

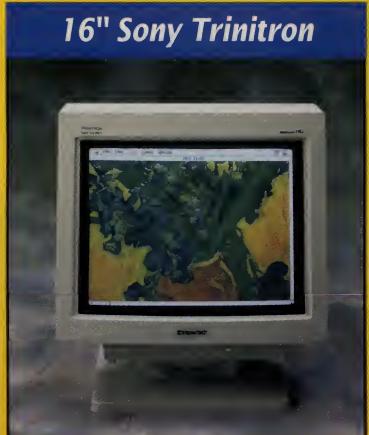


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Includes free 90m DAT

	Softbackup	Retrospect	Remote
2.1 Gig	\$998	\$1048	\$1248
5.0 Gig	\$1398	\$1458	\$1658

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Fujitsu Drives

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105 MB 3.5" LPS	9ms, Fast SCSI, 3yr warr, 200,000 MTBF	\$198 \$258
520 MB 3.5"	9ms, Fast SCSI, 5yr warr, 200,000 MTBF	\$748 \$848
1.1 Gig	3.5" 8.5ms, 5yr warr, 300,000 MTBF, Fast SCSI	\$1198 \$1298
1.2 Gig	5.25" 11.5ms, 5yr warr, (MacWorlds Fastest Gig) Fast SCSI	\$1248 \$1348
2.06 Gig	5.25" 11.5ms, 5yr warr, 300,000 MTBF, Fast SCSI	\$2098 \$2198
2.4 Gig	5.25" 11.5ms, 5yr warr, 300,000 MTBF, Fast SCSI	\$2348 \$2448

*Mean Time Between Failure is the average life expectancy of a drive.

Conner Drives

	Internal	External
C 85 MB 3.5" LPS	2 yr warr, 150,000 MTBF	\$198 \$258
C 170 MB 3.5" LPS	2 yr warr, 150,000 MTBF	\$258 \$318
C 212 MB 3.5" LPS	9ms, 2 yr warr, 150,000 MTBF, Fast SCSI	\$328 \$388
C 540 MB 3.5" 8.5 ms	2 yr Warr, 150,000 MTBF, Fast SCSI	\$858 \$918

These new Conner drives are so reliable, that Conner has been one of Apples largest suppliers of drives. The 150,000 hours Mean Time Between Failure and the incredible speed of the 540 are just two reasons to buy a Conner.

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830 MB 3.5" 12ms, 256 cache, SCSI-2, Internal for CI, Quadra		\$898 \$998

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Internal kit	\$548
External with battery	\$648
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1.6 Gig Elite 1 5.25" 11.5ms, 1 Yr warranty		\$1848 \$1948
2.4 Gig Elite 2 5.25" 11ms, 5 Yr warranty		\$2398 \$2498
3.4 Gig Elite 3 5.25" 11ms, 5 Yr warranty		\$2998 \$3098

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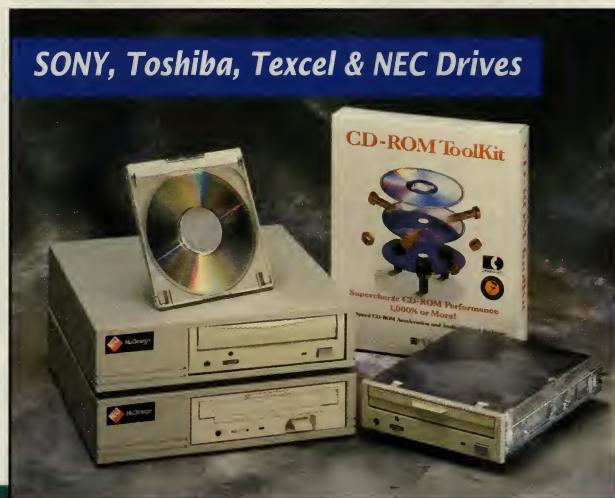
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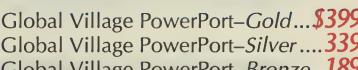
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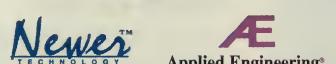
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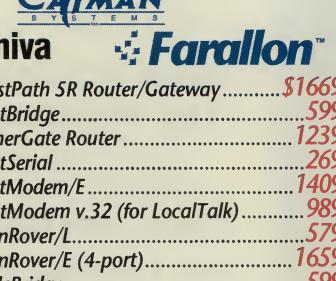


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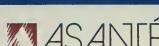
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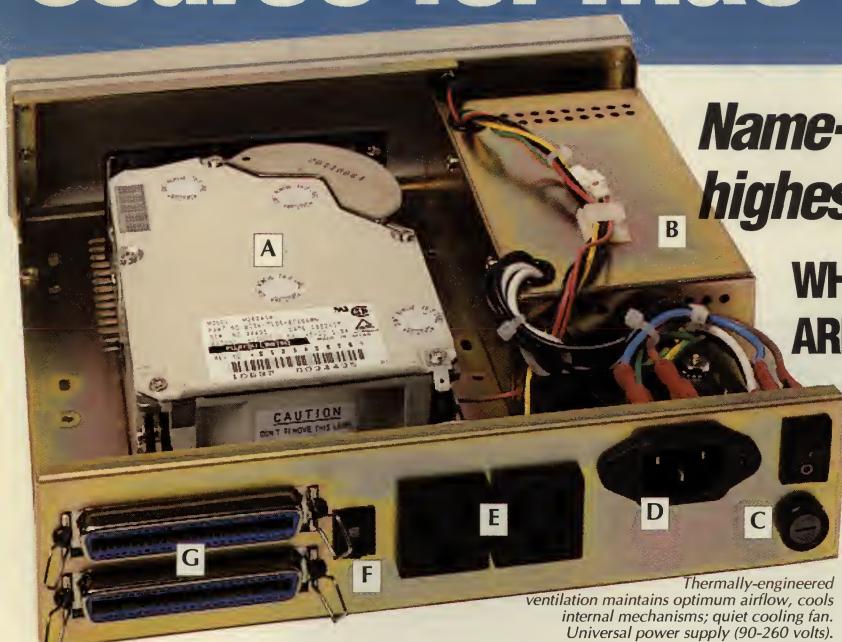
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	Model number	Internal price	External price	Formatted Mac Capacity (in MB)	Average access time (in ms)	Transfer rate* (in MB/second)	Form factor**	Warranty (years)
80 - 120 MB								
Conner 85	CP-30080E	\$209	\$279	82	17	1.5	LP	1
Quantum 85	ELS85	199	269	82	17	1.4	LP	2
Conner 120	CP-30100	259	329	116	17	1.5	LP	1
Maxtor 120	7120	209	279	121	15	1.5	LP	2
120 - 250 MB								
Quantum 127	ELS127	\$229	\$299	124	17	1.4	LP	2
Conner 170	CP-30170E	259	329	160	9	1.5	LP	1
Quantum 170	ELS170	259	329	160	17	1.4	LP	2
Conner 212	CP-30200	359	429	206	12	2.5 ¹	LP	1
Maxtor 213	7213	299	369	207	15	2.8 ¹	LP	2
Quantum 240	LPS240	339	409	234	10	1.4	LP	2
Maxtor 245	7245	329	399	245.6	15	3.0 ¹	LP	2
320 - 570 MB								
Maxtor 340	LXT-340	\$599	\$669	324	15	2.1 ¹	HH	2
Fujitsu 520	M2624FA	799	869	496	9	2.7 ¹	HH	5
Quantum 525	LPS525	899	969	525	10	2.9 ¹	LP	2
Maxtor 540	MXT-540	919	989	546	9	5.5 ²	HH	2
Conner 540	CP-3540	899	969	515	12	5.5 ²	HH	1
Micropolis 560	M2105	1049	1119	532	10	5.0 ²	HH	5
700 MB - 1.3 GB								
Quantum 700	PRO700	\$1199	\$1269	670	10	2.9 ¹	HH	2
Micropolis 800	M2108	1199	1269	698	10	5.0 ²	HH	5
Toshiba 877	MK-438FB	1099	1169	830	12.5	3.0 ¹	HH	2
Quantum 1050	PRO1050	1239	1309	1000	10	2.9 ¹	HH	2
HP 1050	97558	1649	1749	987	13.5	2.8 ¹	FH	5
Fujitsu 1.2	M2266	1249	1349	1079	14.5	3.0 ¹	FH	5
HP 1.2	C2247	1589	1659	1000	10.5	5.3 ¹	HH	5
Micropolis 1.2	M2112	1249	1319	1005	10	5.0 ²	HH	5
Quantum 1.2	PRO1225	1419	1489	1200	10	2.9 ¹	HH	2
Toshiba 1.2	MK-538FB	1399	1469	1200	12.5	4.0 ¹	HH	3
Maxtor 1.2	MXT-1240	1399	1469	1240	9	4.5 ²	HH	3
Conner 1.3	CP-31370	2059	2129	1030	10.5	6.0 ¹	HH	1
1.5 - 3.6 GB								
Fujitsu 2.0	M2652	\$2199	\$2299	1752	11	4.8 ²	FH	5
Seagate 2.1	ST42100N	1699	1799	1900	12.9	3.9 ²	FH	5
Fujitsu 2.4	M2654	2399	2499	2000	11	4.8 ²	FH	5
Micropolis 2.4	M1924	2599	2699	2100	10	4.8 ²	FH	5
Seagate 2.4	ST42400N	2549	2649	2050	11	4.5 ²	FH	5
HP 2.4	C3010	2899	2999	2000	11.5	5.3 ²	FH	5
Seagate 3.4	ST43400N	3399	3499	2750	11	6.0 ²	FH	5
Micropolis 3.6	M1936	3299	3399	3022	10	6.0 ²	FH	5

* Transfer rate (or throughput) depends on your Mac CPU and system configuration. For more information, ask your Hardware That Fits sales partner. **Form Factor Low Profile (LP)=3.5 Half Height (HH)=3.5 Full Height (FH)=5.25

¹ SCSI-2 ² SCSI-2 Fast These drives are most efficient when used with a Macintosh Quadra 800, 950 or a RealTech SCSI-2 card.



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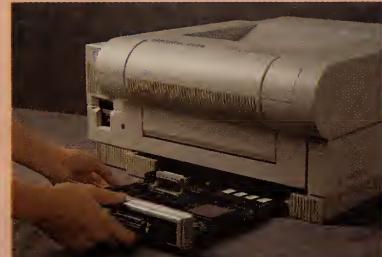
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APS Q 127 ² Quantum 127ELS mechanism	229	299
APS Q 170 ² Quantum 170ELS mechanism	239	309
APS Q 240 ² Quantum LP240 mechanism	339	409
APS Q 525 ² Quantum Lp525 mechanism	799	869
APS Q 1225 ⁵ Quantum 1225P mechanism	1299	1369
→ TOSHIBA		
APS T 1.2G ³ Toshiba MK-538 mechanism	999	1069

¹⁻⁵ Denotes length of manufacturer's warranty

Model	Internal	External
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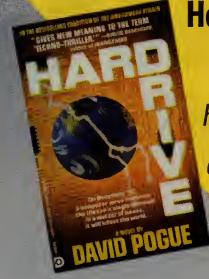
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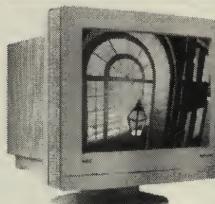
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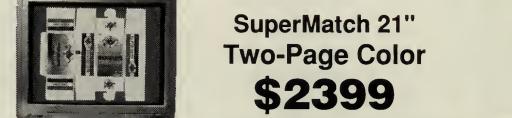
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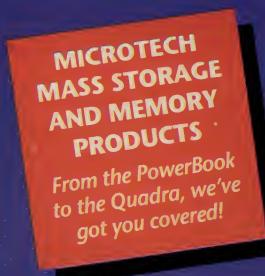
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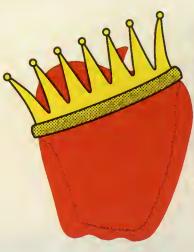
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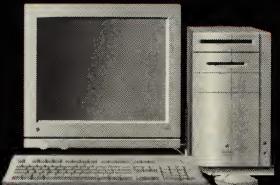
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213	CP-30200	15	2000	24	\$349	\$399		
Quantum								
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127	ELS 127S	17	1800	24	\$199	\$279		
170	ELS 170S	17	2000	24	\$219	\$299		
240	LPS 240	16	2300	24	\$299	\$389		
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Seagate	1.05GB	ST-11200N	10.5	3200	60	\$999	\$1,049	\$1,099
Fujitsu	520MB	M2624ESA	9	2700	60	\$799	\$859	\$899
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240mb	10ms	\$319	\$379	
525mb	10ms	\$829	\$889	

ELS SERIES 3.5" LOW PROFILE, LOW POWER

Unformatted	Capacity	Access	Internal	External
42mb	19ms	\$169	\$229	
85mb	17ms	\$189	\$249	
127mb	17ms	\$215	\$275	
170mb	17ms	\$239	\$299	

PRODRIVE SERIES 3.5" HALF HEIGHT

Unformatted	Capacity	Access	Internal	External
425mb	9ms	\$685	\$735	
700mb	10ms	\$1075	\$1135	
1.0GIG	10ms	\$1119	\$1179	
1.2GIG	10ms	\$1249	\$1309	

GO•Drives have 32k cache, low power consumption, MTBF of 150,000 hours, and ONE Year Warranty. ELS drives have 32k cache, low power consumption, MTBF of 250,000 hours and TWO Year Warranty. LPS drives have 64k-256k cache, MTBF of 250,000 hours, and TWO Year Warranty. PRO drives have 256k cache, MTBF of 350,000 hours, and TWO Year Warranty.

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..."SyQuest is clearly the best choice [for removable storage] for most users... Widely available from dealers and heavily used by service bureaus. SyQuest drives can be counted on for the long term and are reasonably priced. And with the new generation of SyQuest drives just announced, these strengths should only grow."

-- MacWorld, November 1992

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* ClubMac 88c will read and write 44mb cartridges, but will not format 44mb cartridges.

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ClubMac 88mb External (SQ5110).....\$479
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600mb	Teac MT2ST/F50	Analog	CT600F	\$629	\$649
2.0GIG	Archive Python	DAT, DDS	4mm	\$979	\$999
3-5GIG	Archive Turbo DAT	DAT, DDS-DC	4mm	\$1329	\$1349
2.0GIG	WangDAT 3100	DAT, DDS	4mm	\$1045	\$1065
3-5GIG	WangDAT 3200	DAT, DDS-DC	4mm	\$1279	\$1299
2.0GIG	HP 35470A	DAT, DDS	4mm	\$1209	\$1229
3-5GIG	HP 35480A	DAT, DDS-DC	4mm	\$1349	\$1369
2-5GIG	Exabyte 8205	Helical/Compression	8mm	\$1675	\$1695
5-10GIG	Exabyte 8505	Helical/Compression	8mm	\$2629	\$2649

Includes RetroSpec v.2.0 Backup Software, One Tape and ONE Year Warranty

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Model		Capacity	Description	Seek	Internal	External
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CMO-OD3000	Teac	128mb	3.5" Half Height	45ms	\$939	\$969
CMO-3100E	Ricoh	128mb	3.5" Half Height	45ms	\$965	\$995
CMO-JY750	Sharp	594/652mb	5.25" Half Height	40ms	\$2069	\$2099
CMO-5031E	Ricoh	594/652mb	5.25" Full Height	28ms		\$2295
CMO-Tahiti II	MaxOptix	650mb/1.0GIG	5.25" Full Height	35ms		\$2999
128mb Cartridge		3.5" Single Sided				\$39
594/652mb Cartridge		5.25"-512/1024 bytes/sec				\$99
ZCAV Cartridge		5.25" for MaxOptix				\$175

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MAXTOR MXT-540 AND
MXT-1240 OPERATE AT A
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Unformatted Capacity	Model	Access Time	Actual MAC Capacity	Internal	External
XT SERIES & MXT SERIES (3.5" Low PROFILE)					
120mb	7120S	15ms	121mb	\$199	\$259
212mb	7213S	15ms	202mb	\$279	\$339
240mb	7245S	15ms	235mb	\$309	\$369
540mb	MXT-540	8.5ms	521mb	\$899	\$959
LXT & MXT SERIES (3.5" HALF HEIGHT)					
340mb	LXT-340	15ms	324mb	\$499	\$559
1240mb	MXT-1240	8.5ms	1150mb	\$1329	\$1389

Seagate



Unformatted Capacity Model Access Time Actual MAC Capacity Internal External

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250mb ST9295N 16ms 235mb **\$Call** **\$Call**

3.5" HALF HEIGHT

1.2GIG ST11200N 10.5ms 1000mb **\$1125** **\$1185**

2.4GIG ST12400N 9ms 2000mb **\$2195** **\$2255**

5.25" FULL HEIGHT

1.6GIG ST41651N Wren-8 15ms 1350mb **\$1349** **\$1449**

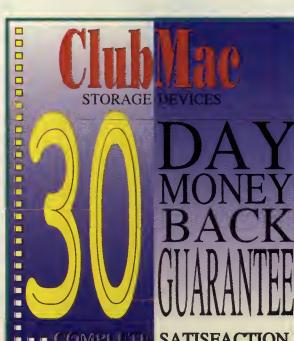
2.1GIG ST42100N Wren-9 12.9ms 1900mb **\$1725** **\$1825**

1.6GIG ST41600N Elite-1 11.5ms 1307mb **\$1799** **\$1899**

2.4GIG ST42400N Elite-2 11ms 2050mb **\$2329** **\$2429**

3.4GIG ST43400N Elite-3 11ms 2750mb **\$2949** **\$3049**

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MultiSync 4FGe \$709

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Mac 24Xp Interface Card .. \$495

NEC's MacFG 24Xp Color Display Interface card brings you affordable 24-bit color capability for color-intensive business graphics, QuickTime, Photo CD and desktop publishing applications. Designed specifically to support NEC's 15" or 17" MultiSync Series monitors.

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Mac 8X Interface Card..... \$639

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Reality Check

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If you already own an NEC 15" or 17" MultiSync Series Color Monitor, you can get a \$100 rebate when you add the NEC MacFG 24Xp Color Display Interface Card to your Mac system. HURRY!! Offer expires June 30, 1993



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CORPORATION**

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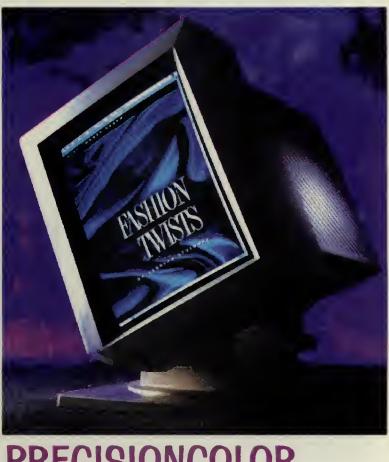
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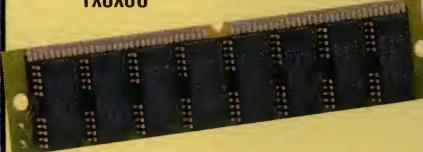
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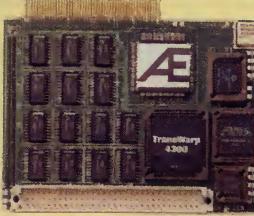
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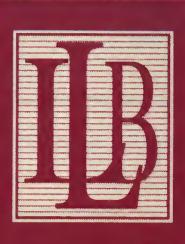
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LPS 525mb	10ms	3.5"TH	829	889
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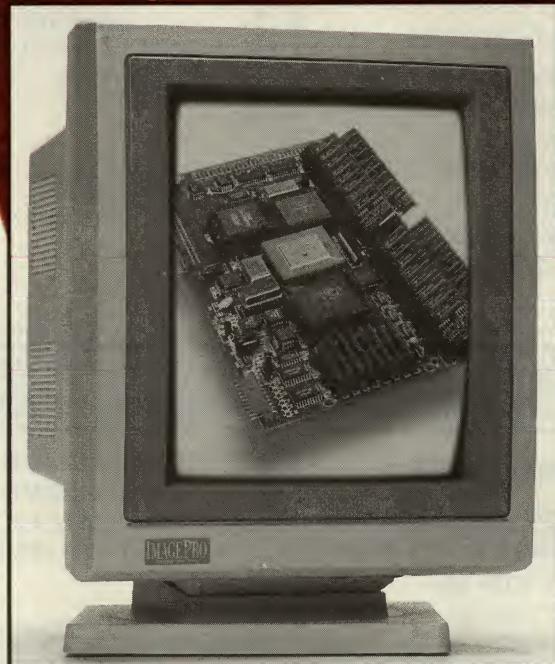
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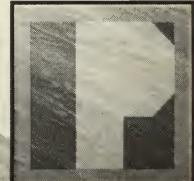
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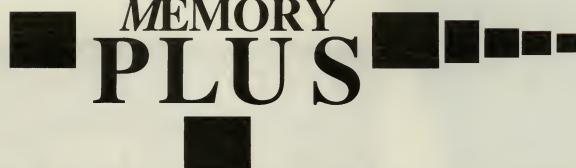
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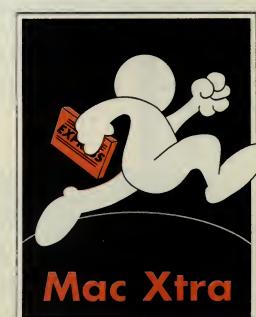
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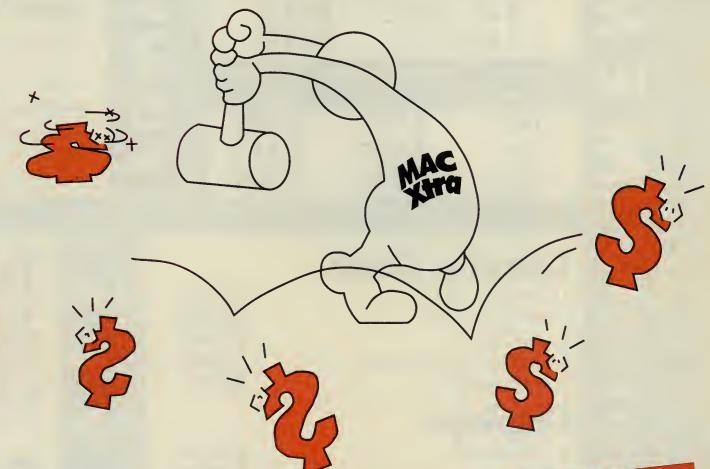
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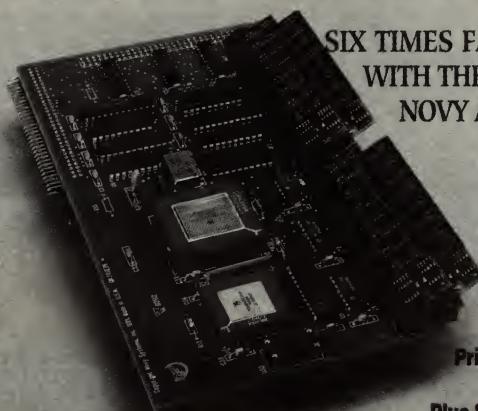
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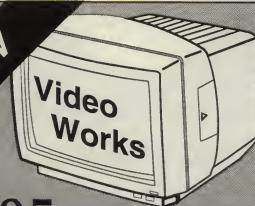
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ELS 85 MB	179	239	Pro 425 MB	879	939
ELS 127 MB	219	279	LPS 525 MB	750	840
ELS 170 MB	239	299	Pro 700 MB	1055	1105
GO 120 MB Drive	375	475	Pro 1050 MB	1085	1259
160 MB GRS 2.5"	519	619	Pro 1225 MB 10 MS	1229	1299

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560 MB	M2105	3.5" 10 MS, 5400 RPM FAST SCSI-2	\$889	\$955
765 MB	M1624	5.25" 14 MS, 5 yr. War. Fast SCSI-2	\$1029	\$1129
1.2 GB	M2112	3.5" 10 MS, 5 yr. War. Fast SCSI-2	1090	1155
1.5 GB	M1528	5.25" 14 MS, 5 yr. War. Fast SCSI-2	1445	1555
2.0 GB	M1548	5.25" 14 MS, 5 yr. War. Fast SCSI-2	1879	1979
2.4 GB	M1924	5.25" 11 MS, 5 yr. War. Fast SCSI-2	2299	2419
3.5 GB	M1936	5.25" 11 MS, 5 yr. War. Fast SCSI-2	2989	3115

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330 MB	M2622	3.5" 9 MS, 5 Yr. War. Fast SCSI-2	689	739
425 MB	M2623	3.5" 9 MS, 5 Yr. War. Fast SCSI-2	710	770
520 MB	M2624	3.5" 9 MS, 5 Yr. War. Fast SCSI-2	739	799
1.2 GB	M2694	3.5" 8.5 MS, 5 Yr. War. Fast SCSI-2	1089	1139
1.2 GB	M2266	5.25" 11 MS, 5 Yr. War. Fast SCSI-2	1079	1189
2.06 GB	M2652	5.25" 11 MS, 5 Yr. War. Fast SCSI-2	1925	1935
2.4 GB	M2654	5.25" 11 MS, 5 Yr. War. Fast SCSI-2	2100	2220

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2.11 GB	C3009	5.25" 2319	2429	
2.35 GB	C3010	5.25" 2549	2659	

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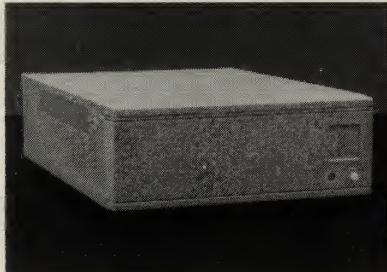
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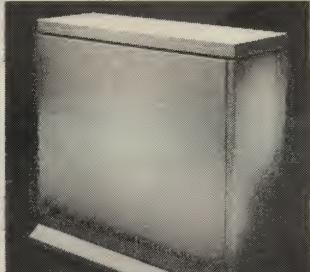
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1079	M2265S	FH	14	\$1189	\$1309
1080	M2694FA	3.5	10	\$1098	\$1198
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850	DSP3085S	3.5	9.5	\$1192	\$1287
1050	DSP3105S	3.5	9.5	\$1158	\$1253
1660	DSP3160S	3.5	10	\$1638	\$1733
2000	DSP5200S	FH	12.5	\$1904	\$2024
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698	2108	3.5	10	\$1093	\$1193
667	1624	HH	15	\$1028	\$1128
1050	2112	3.5	10	\$1094	\$1194
1340	1528	FH	14.5	\$1309	\$1439
1380	1908	FH	11.5	\$1812	\$1932
2100	1924	FH	11.5	SCALL	SCALL
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540	ST3600N	1"	10.5	\$ 855	\$ 955
665	ST4767N	FH	12	\$1025	\$1125
*860	ST1980N	3.5	9.9	\$977	\$1077
1037	ST41200N	FH	16	\$1047	\$1147
*1037	ST11200N	3.5	10.5	\$1047	\$1142
1420	ST41650N	FH	15	\$1228	\$1348
1420	ST41600N	FH	11.5	\$1695	\$1815
*1900	ST42100N	FH	12.9	\$1580	\$1700
*2100	ST42400N	FH	11	\$2217	\$2337
*2900	ST43400N	FH	11	\$2808	\$2928

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Fujitsu	520	3.5"	12	\$ 738	\$ 833
Seagate	1.04GB	3.5"	10	\$1047	\$1142
Fujitsu "Optical"	128	3.5"	30	\$1020	\$1130
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340	LXT340SY	3.5	13	\$ 557	\$ 652
540	LXT540SY	3.5	8.5	\$ 899	\$994
1240	1240S	3.5	8.5	\$1263	\$1358
1059	PO-12S	FH	13	\$1063	\$1193
1345	PI-17S	FH	13	\$1265	\$1395

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525	LPS525S	1"	10	\$ 831	\$ 926
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1050	PD1050S	3.5	10	\$1190	\$1290
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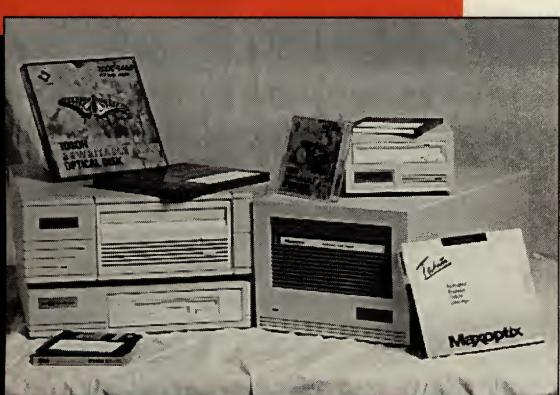
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127Meg	17ms	3600	Quantum	2 Years	\$219	\$289
130Meg	17ms	3600	Maxtor	2 Years	\$209	\$269
170Meg	17ms	3600	Conner	2 Years	\$239	\$299
213Meg	15ms	3600	Maxtor	2 Years	\$299	\$369
213Meg	12ms	4000	Toshiba	1 Year	\$559 (2 1/2" for Powerbook)	
240Meg	16ms	4300	Quantum	2 Years	\$317	\$385
340Meg	15ms	3600	Maxtor	1 Year	\$539	\$599
520Meg	12ms	4400	Fujitsu	5 Years	\$769	\$829
540Meg	8.5ms	6300	Maxtor	2 Years	\$889	\$959
877Meg	12ms	3600	Toshiba	5 Years	\$969	\$1039
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Toshiba	200ms	330KB/sec	Single Disk	\$499	\$569
Toshiba	200ms	330KB/sec	Battery Powered	N/A	\$729
Pioneer*	380ms	150KB/sec	6 Disk Changer	N/A	\$899
Pioneer	270ms	612KB/sec	6 Disk Changer	N/A	\$1289
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2Gig	DAT	Hewlett Packard	12MB/min	\$1199	\$1259
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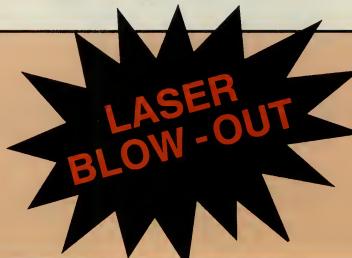
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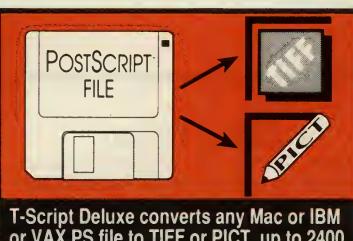


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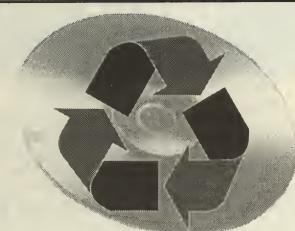
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Testing

From Page 1

determined what gestures will perform which functions. Hancock also supports handwriting recognition and digital ink, a data type that combines a bit map of what's written on screen with information about stroke velocity, weight and direction.

According to Orr, the current version of the pen extension works with most shipping Macintosh applications. Using unmodified

MacWrite Pro, for instance, a user could write text into a document as well as type it.

"Unlike [GO Corp.'s] PenPoint, where there is really no installed base [of software], the Mac operating system is very mature and has a very rich suite of application and development tools that can be used with pen-enabled systems," Orr said.

Apple will encourage test sites to develop their own pen-savvy applications. According to Orr, popular Mac development tools, such

as ACI US Inc.'s 4th Dimension, should work well with a pen.

Apple this summer will release a preliminary pen application programming interface for in-house and commercial developers.

The company will use the results from this test to determine the final design of pen-based PowerBook models. Although Orr wouldn't comment on a release date, he said Apple will definitely release Mac pen technology as a commercial product.

Apple tests PB waters

Hancock

- Handwritten input
- Supports digital ink
- Gesture control of Mac interface
- Compatible with most existing Mac software



Wireless PowerBooks

- Analog cellular voice and data
- RF local and wide-area networking
- CDPD



► **Wireless PowerBooks.** Apple is experimenting with a variety of wireless communications technologies for PowerBooks, including analog cellular and CDPD (cellular digital packet data), plus radio-frequency, local- and wide-area networking.

Orr said his group will field-test some of these wireless technologies later this year.

The big unknown, he said, is what customers will accept in performance and capabilities — and for what price. Sending data via cellular technology, for example, can be quite expensive. Paging, although it doesn't support voice, is much cheaper.

Another question is what interface will work best for voice? Do users really want their PowerBook to act as a telephone, or would they prefer it to store and forward messages like a network-savvy answering machine?

"We're trying to understand real-world usage patterns, which include what people are trying to do, how people are trying to do it and what that costs," Orr said. "It's only when all three issues are really addressed [that] we have a solution."

Customers and developers interested in participating in the Emerging Markets and Technologies program should send their request via the AppleLink address PEN.IDEAS. □

CES

From Page 1

► **Technology alliances.** At CES, Apple announced partnerships with three regional Bell operating companies — Ameritech Corp., BellSouth and US West.

According to a prepared statement, Ameritech said it plans to offer Newton fax and voice-messaging services, including notification, message delivery and random access to messages. BellSouth will test prototype Newton phones for Apple. According to sources, the RBOC is already testing Apple phone devices that don't use Newton technology.

US West will explore screen-based telephony and telephone services for Newton devices.

► **Sharp PDA.** Apple's first Newton partner and the PDA's manufacturer, Sharp Electronics Corp., got its 2 cents in at CES, as well.

According to Gil DeLiso, Sharp director of marketing, the consumer-electronics giant is "in the final stages of refining the product and getting it ready to produce."

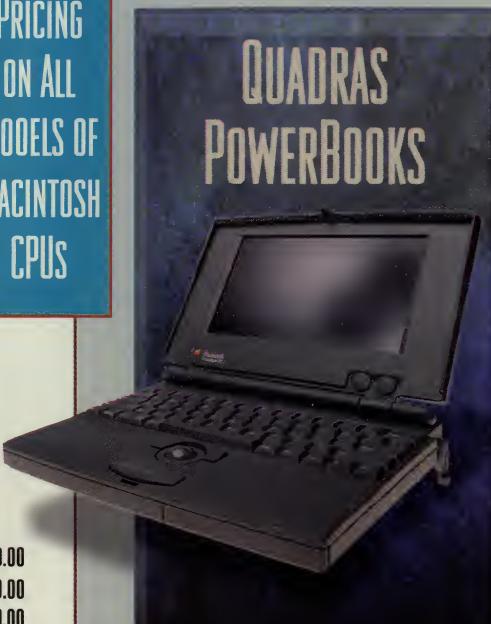
Sharp's PDA will ship in the third quarter and, except for a few cosmetic differences, will



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PowerBooks

From Page 1

with 4 Mbytes of RAM and an 80-Mbyte hard disk, or \$4,519 configured with 4 Mbytes of RAM and a 160-Mbyte hard disk. The 180c is 1 mm thicker than the PowerBook 165c and 2 mm thicker than the 180. The extra thickness comes from the 8.4-inch diagonal, back-lit LCD, which supports as many as 256 colors at one time.

Like the 180, the 180c includes a 33-MHz 68030 CPU, a math coprocessor and support for external monitors. Its RAM is expandable to 14 Mbytes.

Apple claims battery life of one to two hours per charge; the 180c uses the same nickel-cadmium batteries as the other all-in-one PowerBooks, although it fares best on the higher-capacity batteries introduced last fall with the 160 and the 180.

► The PowerBook 145B is priced at \$1,649 with 4 Mbytes of RAM and a 40-Mbyte hard disk, or \$1,899 with 4 Mbytes of RAM and an 80-Mbyte disk. The 145B includes every feature of the 145 except a set of system software disks and an external microphone. It is powered by a 25-MHz '030 but lacks the math coprocessor and external video connections found in higher-end PowerBooks.

Some third-party RAM cards may need to be reworked to fit the new model because Apple put 4 Mbytes of RAM on the logic board instead of on a subassembly. Current internal modems, however, should fit unmodified, the company said.

Unlike previous Mac models but like the Performas, the 145B will not ship with a full set of system disks. System 7.1 is preinstalled on the internal hard disk, and a single system start-up disk is included. The package also includes two utilities that provide basic backup and restore functions.

The 145B and the 180c represent the current bookends of Apple's PowerBook line. Company officials said they hope that the low price of the 145B and the improved color of the 180c will spur sales of PowerBooks, which have leveled off recently after a year of explosive growth.

be identical to Apple's Newton. It should be able to use Newton software and peripherals. It will also offer docking software and an external fax modem.

Sharp's device, which might not use the Newton moniker, will be available through consumer-electronics, office-products and mail-order channels. It will also be sold directly to corporate customers. Sharp is looking at establishing its own network of value-added resellers to develop custom solutions for corporate and institutional customers.

"Corporate customers are very interested in looking at technology that overcomes ease-of-use barriers," DeLiso said. "It's not going to do much good to outfit your sales staff with the best mobile-computing technology if they're going to leave it in their car."

► **Content.** PIE announced that it will produce and distribute interactive media. PIE's publishing group will offer business, general-reference, entertainment and education titles. It will also provide cross-platform media-development tools for creating titles that run on Macs, Windows machines and Apple PDAs. □

Users said they were more impressed by the 180c, thanks to its display, which is they described as a great improvement over the passive-matrix color of the 165c.

Trish Ledoux, an editor at Viz Communications Inc. of San Francisco and a 165c owner, said she plans to move up to a 180c.

"The difference is the active-matrix [screen]," Ledoux said. "There's such a problem with [cursor] submarining on the 165c. The colors aren't as sharp, and the reds are just

dreadful. I want to have something a little nicer, a little sharper. For me, the price is worth it."

Battery life, which many users of the 165c have complained about, is likely to also remain a contested topic with the 180c. Although he is ready to purchase a 180c, the issue concerns Mark Goldschmidt, account manager at MTV Networks in New York.

"The battery life still stinks. Why don't they use the nickel-metal-hydride batteries, like [the ones used] in the Duos?" Goldschmidt said.

The 145B seems to hold less appeal for corporate buyers. According to Todd Hauschmidt, manager of business systems implementation for Control Data Systems Inc. of Minneapolis, cost is less of an issue than screen quality.

"We're not real interested in [the 145B] for our applications," Hauschmidt said. "It's passive-matrix black and white, and that's the main reason we didn't go with it. Active matrix is the minimum requirement for any of our users." □

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Illustrator*From Page 1*

unless you disable Area Select via the Preferences command. You can also turn the display of the selection outlines on and off.

The painting controls have changed considerably. The Paint Style command now opens a floating palette, which you can leave open at all times. The palette is divided into three panels. The first contains a set of paint swatches, which can contain up to 255 custom or process colors, blends, or patterns. You cannot, however, store stroke or line attributes in a custom color swatch.

The second panel in the Paint Style palette has all the controls for defining process and custom colors or for choosing colors from any of several libraries, including Pantone (spot and process), Toyo, Focoltone and TruMatch colors. You can also choose any blends, gradients or pattern fills that you've defined; set the stroke weight; and control overprinting and knockouts for each color.

The final panel has the controls for setting line attributes such as cap and join style, miter limit, and dash patterns. You can collapse the palette so that any of the three panels is visible.

You can apply the settings in the Paint Style palette by either selecting an object and clicking the palette's Stroke and Fill buttons or using the new Paint Bucket tool. The advantage of the Paint Bucket tool is that you don't have to select the object; you just click on it with the Paint Bucket tool. Double-clicking the Paint Bucket lets you set attributes. You

can set this to apply any or all of the characteristics found in the Paint Style palette.

The same options can be set independently for the Paint Bucket's companion tool, the Eye Dropper, which picks up any or all of the above attributes from an existing object. You can toggle between the two tools by holding down the Option key. Together, they provide a fast and flexible way of transferring paint attributes from one object to another.

Illustrator now offers linear and radial blends and gradient fills. You can fill a path with a gradient without resorting to masked blends, as was previously necessary. The Gradients palette lets you create blends quickly and easily between two or more process or custom colors. Another new tool, the Gradient Vector tool, lets you control the direction of gradient fills and their starting and ending points. The range of possible effects is vast, and operation of the tool is efficient and intuitive.

Text features are mostly unchanged, but text alignment, hyphenation, hanging punctuation, and word and letter spacing can now be set from the Paragraph palette. In addition, font, size, leading, tracking, baseline shift and kerning controls are available in the Character palette.

The final noteworthy new feature is the introduction of plug-in filters that resemble Photoshop's. There are several types of filter. Some of the more intriguing are the Pathfinder filters, which let you combine, add and subtract two or more paths in various interesting ways; the Distort filters, which let you roughen an object's shape for a hand-drawn look or

apply free perspective distortion; the Select filters, which let you quickly select all objects with the same fill color, stroke color, stroke weight or Paint Style; and the Stylize filters, which have names like Bloat and Punk. Bloat curves all the line segments outward by a specified percentage, while Punk turns all the control points into spikes.

One surprising omission in Illustrator 5.0 is the lack of support for PostScript Level 2 pattern resources. Pattern fills in the new version are the same as those in previous versions and cause RIPs (raster image processors) just as much difficulty. No mention of Level 2 is made in the prerelease documentation we received.

Also, while this revision of Illustrator goes significantly beyond the current version of FreeHand in most areas, it still requires Adobe Separator to produce color separations.

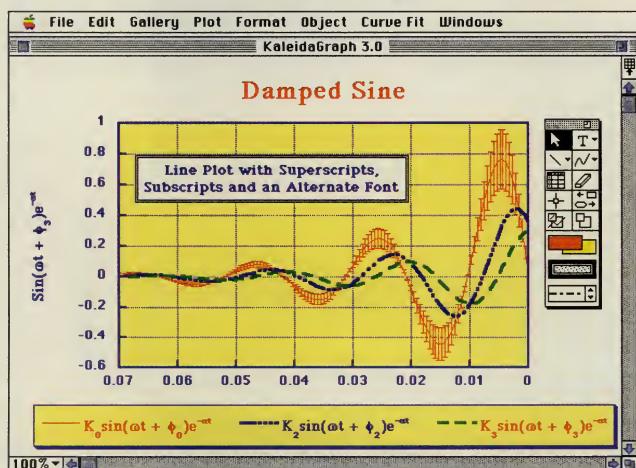
All in all, though, this is a very useful upgrade. Some lovers of Illustrator's squeaky-clean interface may be confused by the plethora of palettes, but we suspect their dismay will quickly turn to enthusiasm when they discover the speed and flexibility the new interface features offer.

Illustrator 5.0 is scheduled to ship sometime this summer for \$595. Upgrades from Version 4.0 will be \$149 until Aug. 31 and \$199 thereafter.

Adobe Systems Inc. is at 1585 Charleston Road, P.O. Box 7900, Mountain View, Calif. 94039-7900. Phone (415) 961-4400; fax (415) 961-3769. □

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Newton E-mail*From Page 1*

name appears in the user's contact database; the sender's name and return address will be automatically entered in a header.

Messages may take one of two forms: text only and text plus Newton objects. The text-only option will create messages that can be read on any computer. The second option is for messages to other Newton users; it transmits an exact duplicate of the object, which can then be used in the recipient's PDA.

The system will store outgoing messages in an Out Box when the user is off-line; once a connection to the Newton E-mail host is established, pending mail is sent and mail waiting in the user's Newton E-mail In Box is retrieved.

Newton users will have several shortcuts at their disposal to hide some of the complexity of E-mail. If the user writes "mail John" on a note-pad item and only one John exists in the address book, the note pad's contents will be addressed to that John. If John prefers to get his mail via AppleLink and that information is stored with the sender's address book, the message will automatically be addressed so it will be routed through the Newton E-mail host system to John's account on AppleLink.

Access to the host mail system, like other E-mail services, will require an account password, and the Newton itself has a password feature that prevents unauthorized use. Newton E-mail, however, lacks advanced security features such as authentication and encryption.

Newton E-mail is one part of a four-tiered communications system. Users will also be able to send faxes via a fax modem; print to AppleTalk printers; and "beam" to another Newton using wireless radio transmitters, which are expected to be standard on some models. □

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Looking ahead

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June 28	Cross-platform tools	June 17	June 15
July 5	Database	June 24	June 22
July 12	Gateways Presentations	July 1	June 29
July 19	Vertical Markets Contact software	July 8	July 6
July 26	Multimedia Security	July 15	July 13
Aug 2	Networking	July 22	July 20

*For more information on these articles, call (415) 243-3581.



The seen and not-seen scene

As long as we have Ross Perot we will always have ample opportunity for sarcasm. But enough about serious affairs of statecraft. Of late, most thinking Americans have been more concerned with the troubling matter of

Barney, the animated, dichromatic Jurassic Park refugee whom many fear is methodically turning the brains of an entire generation of toddlers into happy-talk mush.

And the fears of these concerned adult citizens could be quite well-founded. Imagine

these youngsters reaching the age at which they can truly enjoy the fruits of multimedia, only to be incapable of appreciating the ultimate digital experience. Fortunately, there's still hope that our well-supported public-school system will rescue the

children from a life of post-intellectualism.

Those among us who still possess functioning neurons will perhaps be interested in the Knife's report that the consortium behind the PowerPC has decided to support the MPEG video-compression standard. That means we'll soon have the real-time compression/decompression capabilities needed to bring full, professional video to the desktop — all the Barney kids can stand and more at the click of a mouse button.

Not seen. Last week's Consumer Electronics Show blew in and out of Chicago without a peep from Apple about Newton prices and specifications. In fact, Apple, contrary to some widely and wildly circulated predictions, had absolutely nothing really new to announce about Newton. This, of course, left observers wondering about other PIE (Personal Interactive Electronics) products.

For example, there's the PowerCD, which Apple announced last March for shipment sometime this summer. The Knife's sources claim that the Philips N.V.-manufactured product has presented unanticipated compatibility problems, requiring some serious engineering tweaking to rectify. Although the prospect of tweaking engineers working on a serious project doesn't inspire all that much confidence, sources are optimistic that everything should be in order in time for shipping before the end of the year.

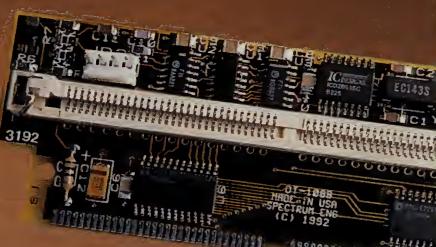
As it turns out, the fourth quarter might as well be named the season of optimism at Apple. The Knife says that Apple is projecting Newton sales at as many as 200,000 units for that all-too-brief three-month period. That would, indeed, be a stunning accomplishment, especially if you remember that Apple sold only 400,000 PowerBooks in its first 12 months and PowerBooks arrived on the scene with a full complement of ready-to-run software titles.

To be seen. To the delight of those who think that an interface can never be GUI enough or run on too many platforms, there's good news straight ahead. The Knife has learned that Apple is planning to end rampant speculation and formally announce Companion, the DR DOS-based version of the Mac Finder and Toolbox for Intel platforms. And that's all good because all those meetings between Novell and Apple were causing a lot of innocents to jump to some pretty outrageous conclusions. The time is June 29 and the place is the Jacob Javits Convention Center on Manhattan's bustling West Side.

Goodbye to all that. The Knife joins the entire Newton group in offering a tip of his hat and a farewell and good luck to Larry Tesler as he leaves that group to join the Macintosh Software Architecture Division. Somehow it's a little difficult to contemplate the Newton project without its widely acknowledged step-father. But just as the Hearst Corp. will find a new head, so will the Newton group. □

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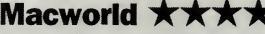


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